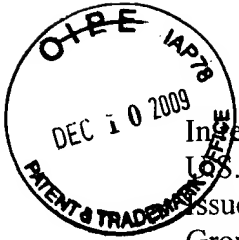


12-11-09



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Staats, *et al.*
U.S. Patent No.: 7,512,434
Issued: March 31, 2009
Group Art Unit: 3768
Serial No: 09/851,462
Examiner: Michael T. Rozanski
Filed: May 8, 2001
For: Remotely powered injector

Ok to enter.
B. B. B.

December 10, 2009

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Citation of prior art under 37 CFR 1.501

A substantial aspect of the subject matter claimed in the above-identified U.S. Patent (hereinafter the "'434 patent") is the use of an AC Adaptor instead of, or in addition to, one or more batteries. However, long before the Critical date of the '434 patent (*i.e.*, prior to May 8, 2000) persons of ordinary skill conventionally used AC Adaptors to power devices with, or instead of, batteries.

Indeed, the use of an AC adaptor to power a device that previously was battery powered, prior to the Critical date, was ubiquitous and conventional. For instance, portable radios (*e.g.*, the 1964 Zenith Royal 1000-1 Transoceanic), tape players, CD players (*e.g.*, the 2000 Awia XP-R1000), video cameras (*e.g.*, the 2000 Sony DCR-TRV120), video game players (*e.g.*, the 1989 Nintendo GAME BOY), cell phones (*e.g.*, the 1999 Nokia 5160), calculators (*e.g.*, the 1975 Hewlett-Packard HP-25) *etc.* used AC adaptors instead of, or in addition to, batteries as their source of electrical power. Documentary evidence – *i.e.*, printed publications – showing the ubiquitous and conventional nature of AC Adaptors are provided by the enclosed documents, namely:

- 1) Nintendo GAME BOY™ Rechargeable Batter Pack/ AC Adaptor Owner's Manual (1989);
- 2) Sony Digital Video Camera Recorder Operating Instructions for the DCR-TRV120/TRV320 (2000);
- 3) Awia XP-R1000 Operating Instructions;
- 4) Nokia 5160/5160i Owner's Manual (1999 – 2001);
- 5) Hewlett-Packard HP-25 Owner's Handbook (1975) and
- 6) 3Com Handbook for the Palm V™ Organizer (1998-1999).

Specifically, the Nintendo GAME BOY™ Rechargeable Batter Pack/ AC Adaptor Owner's Manual, on page 4, describes "How to use the Rechargeable Battery Pack as an AC Adaptor."

The Sony Digital Video Camera Recorder Operating Instructions for the DCR-TRV120/TRV320, on page 13, states that "[w]hen you use your camcorder for a long time, we recommend that you power it from a wall outlet using the AC power adaptor."

The Awia XP-R1000 Operating Instructions, pages 8 – 9, describes "Using [the CD player] on AC House Current," and states that the user should "[c]onnect the supplied AC adaptor in the same way as recharging the batteries."

The Nokia 5160/5160i Owner's Manual, on page 4, answers the question "Can I make calls while charging?" with a "Yes . . ."

The 1975 Hewlett-Packard HP-25 Owner's Handbook states (on pages 101-102) that:

Your calculator contains a rechargeable battery pack that includes two nickel-cadmium batteries. When you receive your calculator, the battery pack inside may be discharged, but you can operate the calculator immediately by using the battery charger/ac adapter.

3Com's Handbook for the Palm V™ Organizer, at pages 10-11, describes the use of an AC adapter, via the cradle, to charge the device's batteries and to enable operation while the battery is being charged.

These references are pertinent to each of the claims of the '434 patent, because each of the claims calls for a non-battery power source of electrical power. For instance, Claim 8 recites:

A method of connecting a battery-powered magnetic resonance (MR) injector system in a shielded magnet room to a remote power supply, the method comprising: placing a power supply outside of the shielded magnet room, the power supply coupled to an AC outlet for electrical power; providing shielded cables having conductors adapted for electrical power transmission, wherein one cable positioned outside the magnet room couples the power supply to a penetration panel and the other cable positioned inside the magnet room couples the power from the power supply from the penetration panel the MR injector system, providing a radio frequency filter at the penetration panel reducing radio frequency electrical energy carried through at least one conductor of at least one of said shielded cables; and connecting a power control of the MR injector system in said shielded magnet room to conductors of the shielded cables *so that power from said power supply is provided to components of said injector system that previously received only battery power.* (Emphasis added)

Both Claims 18 and 28 describe the conventional AC Adaptor inferentially by referring to a "a power connection"

In view of the pertinence of these references to the level of skill of the ordinary artisan, the undersigned respectfully requests that these references be entered into the file of the above-identified patent.



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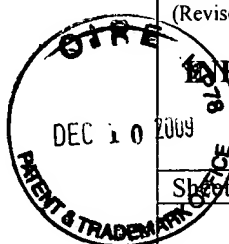
CERTIFICATE OF SERVICE

I, Walter Scott, an attorney, certify that on the 10th day of December 2009, I caused a true and correct copy of this *Citation of prior art under 37 CFR 1.501* to be deposited with the United States Postal Service and served on the attorney of record listed below via First Class Mail, postage prepaid:

Thomas W. Humphrey, Esq.
Wood Herron & Evans
2700 Carew Tower
Cincinnati, Ohio 45202

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Reg. No. 30,588

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Charlotte, NC 28280-4000
Tel New York Office (212) 210-9518
Fax Charlotte Office (704) 444-1111



Substitute for form 1449/PTO (Revised 07/2007)		Complete if Known	
INFORMATION DISCLOSURE STATEMENT <i>(Use as many sheets as necessary)</i>		Application Number	09851462
		Filing Date	2009-05-08
		First Named Inventor	Staats, et al
		Art Unit	3768
		Examiner Name	Michael T. Rozanski
		Attorney Docket Number	048777/371378
Sheet	1	of	1
OTHER DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s) , volume-issue number(s), publisher, city and/or country where published.	English Language Translation Attached
	1	Nintendo GAME BOY™ Rechargeable Battery Pack/ AC Adaptor Owner's Manual (1989)	
	2	Sony Digital Video Camera Recorder Operating Instructions for the DCR-TRV120/TRV320 (2000)	
	3	Awia XP-R1000 Operating Instructions	
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	5	Hewlett-Packard HP-25 Owner's Handbook (1975) and	
	6	3Com Handbook for the Palm V™ Organizer (1998-1999)	

Examiner Signature		Date Considered	
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*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Conclusion

The use of an AC Adaptor in conjunction with, or instead of, batteries, as of the Critical Date, was a conventional practice known among those in the relevant art due to the widespread adaption of this technology in consumer electronic devices.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Walter Scott", with a long horizontal flourish extending to the right.

Walter Scott

Registration No. 30,588

Customer No. 00826

ALSTON & BIRD LLP

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Tel New York Office (212) 210-9518

Fax Charlotte Office (704) 444-1111

DMG-RB-USA-1

RECHARGABLE
BATTERY PACK/
AC ADAPTOR

OWNER'S MANUAL

Thank you for buying the Nintendo GAME BOY (tm) Rechargeable Battery Pack.

Important: Please read this Owner's Manual to ensure proper handling, and
then save the Owner's Manual for future reference.

Contents

1. Name Of Each Part	2
2. How To Use The Rechargeable Battery Pack	3
3. Specifications	5
4. Troubleshooting	5
5. 90 DAY LIMITED WARRANTY	6
6. REPAIR/SERVICE AFTER EXPIRATION OF WARRANTY	7
7. CONSUMER PARTS LIST AND ORDER FORM	8

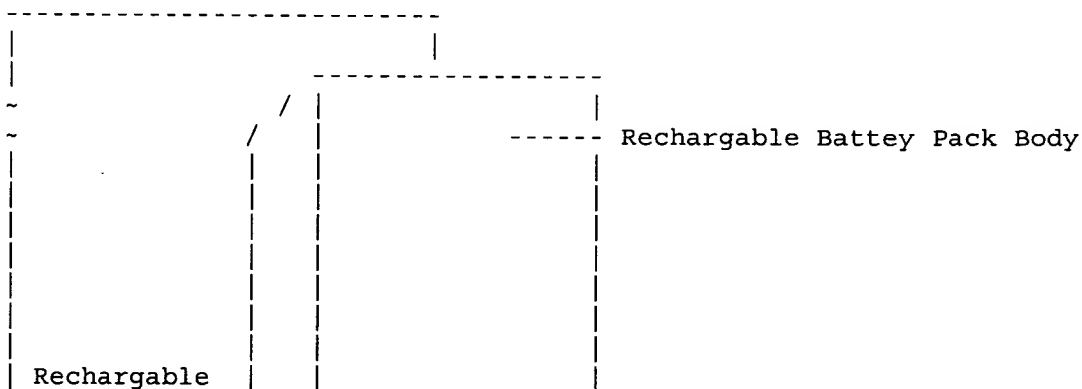
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that it has met our standards for excellence
in workmanship, reliability and
entertainment value. Always look for this
seal when buying games and
accessories to ensure complete Official
compatibility with your Nintendo
Game Boy System. Seal of Quality

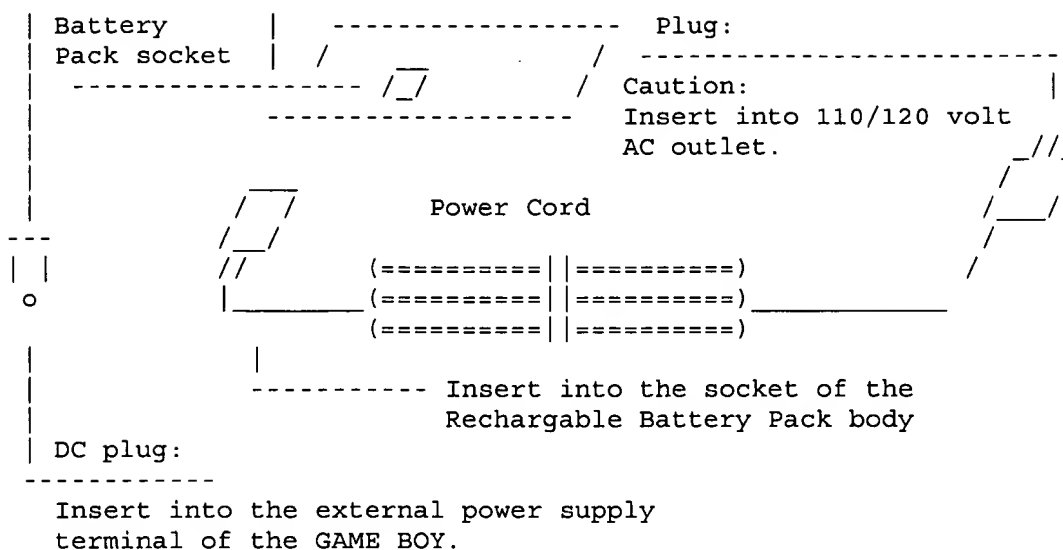
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1

1. Name of Each Part





Make sure you've fully recharged the Rechargeable Battery Pack before using it for the first time.

2

2. How to Use the Rechargeable Battery Pack

How to Charge the rechargeable Battery Pack

1. Connect the power cord into the Rechargeable Battery Pack body. Insert the power cord plug into the 110/120 volt AC outlet. (Recharge the rechargeable Battery Pack using only a 110/120 volt AC power outlet.)
2. When recharged (about 8 hours), remove the power cord from the Rechargeable Battery Pack body and the outlet.
 - * Hold the plug body when removing the power cord.
 - * The recharging time is about 8 hours.
 - * The Rechargeable battery Pack will slowly discharge even if it is not being used. For this reason, use the Rechargeable Battery Pack immediately after it has been recharged.
 - * The Rechargeable Battery Pack can be recharged about 300 times.

How to use the Rechargeable Battery Pack as a Battery

1. Connect the DC plug to the external power supply terminal of the GAME BOY.
2. Turn the power switch of the GAME BOY to ON.
 - * The Rechargeable Battery Pack will last about 10 hours. (Varies with volume setting and games being played.)

3

How to use the Rechargeable Battery Pack as an AC Adaptor

(using the Battery Pack in this manner will allow continuous use of the GAME BOY without loss of power.)

1. Connect the DC plug to the external power supply terminal of the GAME BOY.
2. Connect the power cord to the Rechargeable Battery Pack and a 110/120 volt AC outlet.
3. Turn the power switch of the GAME BOY to ON.
 - * If the Rechargeable Battery Pack has completely discharged, it may not function as an AC adapter. In this case, turn the power switch of the GAME BOY to OFF and recharge the Rechargeable Battery Pack for a short while (from several minutes to 1 hour).
 You should then be able to use it as an AC adapter.

Cautions

- * Do not short or put the end of the DC plug into the mouth. This may cause damage to the batteries, electrical shock or minor burns.
- * The Rechargeable Battery Pack is for indoor use only. Prevent it from becoming wet. Allowing it to become wet may cause damage to the Rechargeable Battery Pack or the GAME BOY.
- * Do not recharge for more than 8 hours or recharge it below 32°C (0°C) or above 100°C (40°C). This will shorten the service life of the Rechargeable Battery Pack
- * Do not recharge or leave the Rechargeable Battery Pack in the direct sunlight, near heating equipment, or in very humid areas. This may cause a malfunction.
- * The Rechargeable Battery Pack can only be used with the GAME BOY. Do not use with other equipment. This may cause a malfunction.
- * Turn the power switch on the GAME BOY to OFF before inserting (or removing) the DC plug of the rechargeable Battery Pack.
- * When unplugging the cords, be sure to pull from the plug itself, not from the wires.
- * Do not dispose of in fire.
- * Do not attempt to open as there are no user serviceable parts inside.

4

3. Specifications

Input power supply		110/120 volt AC, 3.5W
Output		DC 4.8V, 150mA
Recharging Time		Approx. 8hrs
Body weight		Approx. 300g
Power cord length		1m

4. Troubleshooting and Customer Support

If the Rechargeable battery Pack does not work properly during use, stop use immediately and check the following items before calling for service.

Symptom	Check Location	Remedy
* Cannot	Is DC plug inserted into the	Either set the switch to OFF,

Recharge	Game Boy? Is the GAME BOY power switch on?	or remove DC plug from GAME BOY.
* GAME BOY does not work when Rechargeable Battery Pack is used as AC Adapter.	Is Rechargeable Battery Pack connected properly?	Be sure the Rechargeable Battery Pack is connected properly. It is also possible that the battery Pack is completely discharged. If this is the case, turn off the power switch of the GAME BOY OFF, recharge for 30 minutes to an hour, then turn the unit back ON.

If the Rechargeable battery pack does not work even after checking the above, do not repair it yourself. Please call the Nintendo Consumer "Hotline" at 1-800-255-3700.

5

7. CONSUMER PARTS LIST AND ORDER FORM

GAME BOY CONSUMER PARTS LIST & ORDER FORM

Nintendo Part No.	Part Name	Price	Quantity	Amount of Purchase
18097	Stereo Headphones	\$8.50		
18098	Battery Cover	1.00		
18099	Connector Cover	.50		
18100	Video Link (tm) Cable	8.50		
18101	*Power Cord	5.00		
18102	Game Pak Case	1.00		
18103	Game Boy Manual	2.00		
XXX	Game Pal Manual (Specify name)	1.25		
	PLEASE NOTE: Nintendo cannot supply Game Manuals for 'licensed' games. These games can be identified by the words 'Licensed by Nintendo' on the packaging. Please contact the Game Licensee (whose name is also on the package) directly for these items. (You may also call Nintendo at 1-800-255-3700 for the Licensee's address and telephone number.)			
	*Rechargeable Battery Pack replacement part.			
SUB TOTAL				
WASHINGTON STATE RESIDENTS ADD 8.1% SALES TAX				
BRITISH COLUMBIA RESIDENTS ADD 6% SLAES TAX				

POSTAGE & HANDLING (\$2 For Orders Of \$4 or more, 50¢
For Orders of Less Than \$4)

TOTAL AMOUNT DUE

* FOR ORDERING INSTRUCTIONS PLEASE SEE NEXT PAGE.

8

To Order By Phone (Requires VISA or MASTERCARD ONLY. NO C.O.D. Orders)

Call 1-800-255-3700 6:00 A.M. to 6:00 P.M.
Pacific Time (MON. to SAT.)

Please have your VISA or MASTERCARD card number and expiration date ready.

To Order By Mail

1. Please complete the following:

Name _____ Phone () _____
Street Address _____
City _____ State _____ Zip _____

2. Enclose Money Order or Credit Card Authorization for total amount due.

Please charge total amount due of \$ _____ to my:
(VISA or MC?) _____ Card No. _____ Expiration Date _____
Name on Card (Print) _____ Signed _____

3. Mail to:

In the United States:
Nintendo of America Inc.
4820 - 150th Avenue N.E.
Redmond WA 98052

In Canada:
Nintendo of Canada Ltd.
110 -13480 Crestwood Place
Richmond BC V6V2J9

Allow 4-6 weeks for delivery. We cannot accept cash, stamps, or C.O.D. orders. Prices are applicable in the United States and Canada only and are subject to change without notice.

"Rechargeable Battery Pack/AC Adapter Owner's Manual"
Converted to ASCII text by FM2000 on 2/13/98 by FM2000
cassanit@lightlink.com
Warranty info omitted

There is an error on page 4; "32øC (0øC)"; this is in the original manual; it should read "32ø (0øC).

DMG-RB-USA-1

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4. Troubleshooting	5
5. 90 DAY LIMITED WARRANTY	6
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7. CONSUMER PARTS LIST AND ORDER FORM	8

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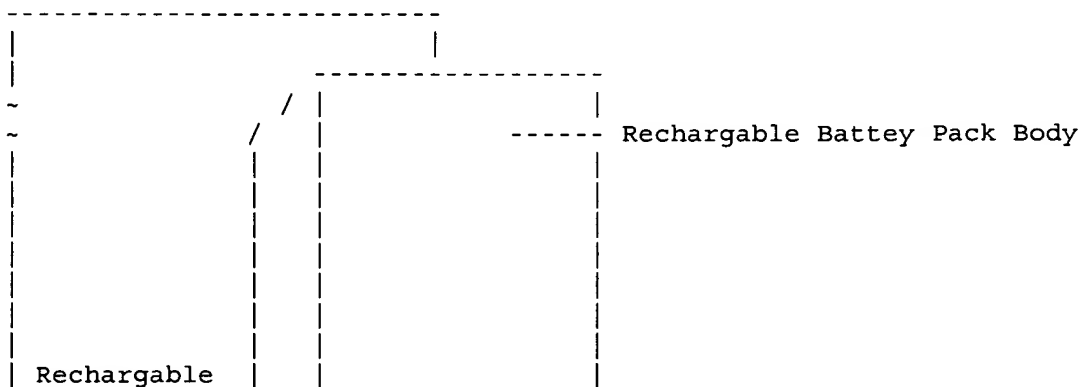
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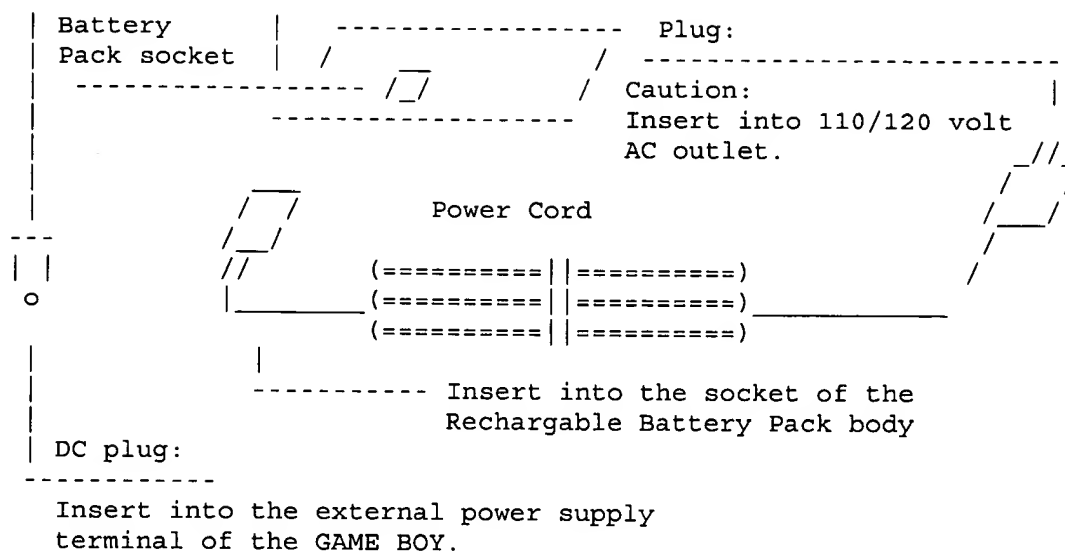
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1

1. Name of Each Part





Make sure you've fully recharged the Rechargeable Battery Pack before using it for the first time.

2

2. How to Use the Rechargeable Battery Pack

How to Charge the rechargeable Battery Pack

1. Connect the power cord into the Rechargeable Battery Pack body. Insert the power cord plug into the 110/120 volt AC outlet. (Recharge the rechargeable Battery Pack using only a 110/120 volt AC power outlet.)
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 - * The recharging time is about 8 hours.
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 - * The Rechargeable Battery Pack can be recharged about 300 times.

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1. Connect the DC plug to the external power supply terminal of the GAME BOY.
2. Turn the power switch of the GAME BOY to ON.
 - * The Rechargeable Battery Pack will last about 10 hours. (Varies with volume setting and games being played.)

3

How to use the Rechargeable Battery Pack as an AC Adaptor

(using the Battery Pack in this manner will allow continuous use of the GAME BOY without loss of power.)

1. Connect the DC plug to the external power supply terminal of the GAME BOY.
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3. Turn the power switch of the GAME BOY to ON.
 - * If the Rechargeable Battery Pack has completely discharged, it may not function as an AC adapter. In this case, turn the power switch of the GAME BOY to OFF and recharge the Rechargeable Battery Pack for a short while (from several minutes to 1 hour).

You should then be able to use it as an AC adapter.

Cautions

- * Do not short or put the end of the DC plug into the mouth. This may cause damage to the batteries, electrical shock or minor burns.
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4

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Output		DC 4.8V, 150mA
Recharging Time		Approx. 8hrs
Body weight		Approx. 300g
Power cord length		1m

4. Troubleshooting and Customer Support

If the Rechargeable battery Pack does not work properly during use, stop use immediately and check the following items before calling for service.

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6:00 A.M. to 6:00 P.M.

Pacific Time (MON. to SAT.)

Please have your VISA or MASTERCARD card number and expiration date ready.

To Order By Mail

1. Please complete the following:

Name _____ Phone () _____
Street Address _____
City _____ State _____ Zip _____

2. Enclose Money Order or Credit Card Authorization for total amount due.

Please charge total amount due of \$ _____ to my:
(VISA or MC?) _____ Card No. _____ Expiration Date _____
Name on Card (Print) _____ Signed _____

3. Mail to:

In the United States:
Nintendo of America Inc.
4820 - 150th Avenue N.E.
Redmond WA 98052

In Canada:
Nintendo of Canada Ltd.
110 -13480 Crestwood Place
Richmond BC V6V2J9

Allow 4-6 weeks for delivery. We cannot accept cash, stamps, or C.O.D. orders. Prices are applicable in the United States and Canada only and are subject to change without notice.

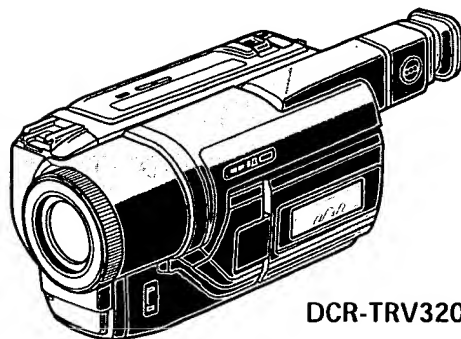
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cassanit@lightlink.com
Warranty info omitted

There is an error on page 4; "32øC (0øC)"; this is in the original manual; it should read "32ø (0øC).

Digital Video Camera Recorder 8

Operating Instructions

Before operating the unit, please read this manual thoroughly, and retain it for future reference.



DCR-TRV320

Digital Handycam



Digital 8
DCR-TRV120/TRV320

Welcome !

Congratulations on your purchase of this Sony Digital Handycam camcorder. With your Digital Handycam, you can capture life's precious moments with superior picture and sound quality.

Your Digital Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

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Furthermore, “™” and “®” are not mentioned in each case in this manual.

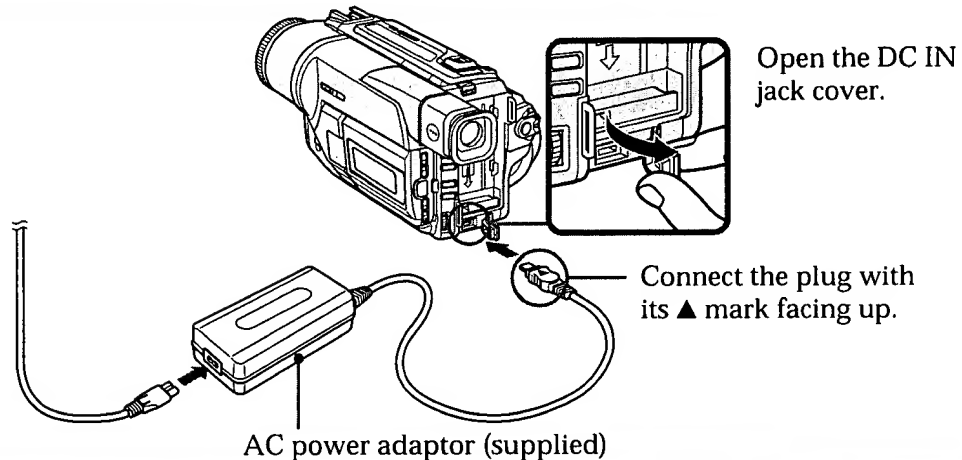
Quick Start Guide



This chapter introduces you to the basic features of your camcorder. See the page in parentheses “()” for more information.

1 Connecting the power cord (p. 13)

Use the battery pack when using your camcorder outdoors (p. 9).



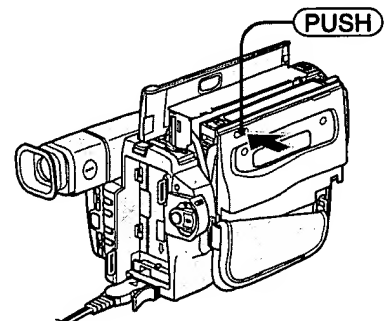
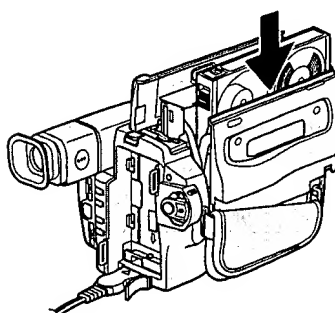
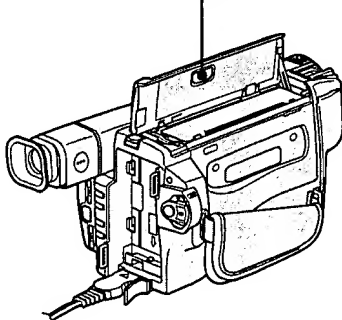
2 Inserting a cassette (p. 14)

- 1 Open the lid of the cassette compartment, and press EJECT. The compartment opens automatically.



- 2 Insert a cassette into the cassette compartment with its window facing out and the write-protect tab on the cassette up.

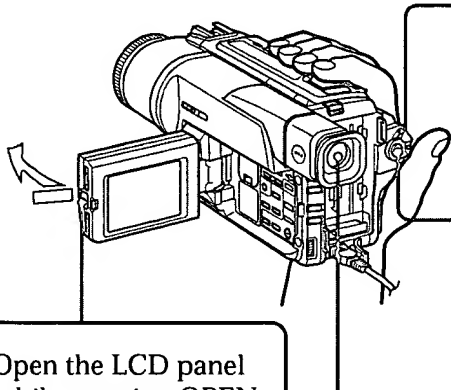
- 3 Close the cassette compartment by pressing the **PUSH** mark on the cassette compartment. The cassette compartment automatically goes down. Close the lid of the cassette compartment.



3

Recording a picture (p. 15)

- ① Remove the lens cap.

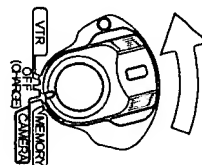


- ③ Open the LCD panel while pressing OPEN. The picture appears on the LCD screen.

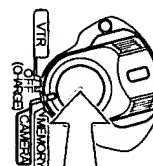
Viewfinder

When the LCD panel is closed, use the viewfinder placing your eye against its eyecup. The picture in the viewfinder is black and white.

- ② Set the POWER switch to CAMERA while pressing the small green button.

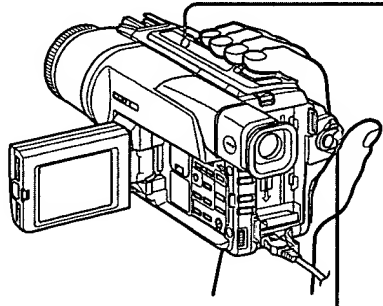


- ④ Press the red button. Your camcorder starts recording. To stop recording, press the red button again.

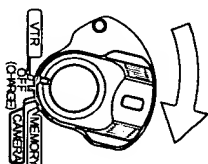


4

Monitoring the playback picture on the LCD screen (p. 23)



- ① Set the POWER switch to VTR while pressing the small green button.



- ② Press << to rewind the tape.

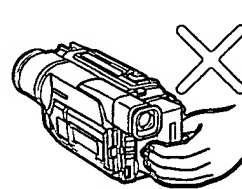
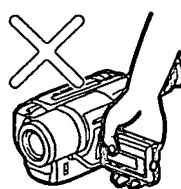


- ③ Press > to start playback.



Note

Do not pick up your camcorder by holding the viewfinder, the LCD panel or the battery pack.



Using this manual

The instructions in this manual are for the two models listed in the table below. Before you start reading this manual and operating your camcorder, check the model number by looking at the bottom of your camcorder. The DCR-TRV320 is the model used for illustration purposes. Otherwise, the model name is indicated in the illustrations. Any differences in operation are clearly indicated in the text, for example, “DCR-TRV320 only.”

As you read through this manual, buttons and settings on your camcorder are shown in capital letters.

e.g. Set the POWER switch to CAMERA.

When you carry out an operation, you can hear a beep sound to indicate that the operation is being carried out.

Types of differences

DCR-	TRV120	TRV320
MEMORY mark* (on the POWER switch)	—	●
Self-timer	—	●

● Provided

— Not provided

* The model with MEMORY marked on the POWER switch is provided with memory functions. See page 71 for details.

Before using your camcorder

With your digital camcorder, you can use Hi8 **Hi8**/Digital8 **D** video cassettes. Your camcorder records and plays back pictures in the Digital8 **D** system. Also, your camcorder plays back tapes recorded in the Hi8 **Hi8**/standard 8 **8** (analog) system. You, however, cannot use the functions in “Advanced Playback Operations” on page 48 to 55 for playback in the Hi8 **Hi8**/standard 8 **8** system. To enable smooth transition, we recommend that you do not mix pictures recorded in the Hi8 **Hi8**/standard 8 **8** with the Digital8 **D** system on a tape.

Note on TV color systems

TV color systems differ from country to country. To view your recordings on a TV, you need an NTSC system-based TV.

Copyright precautions

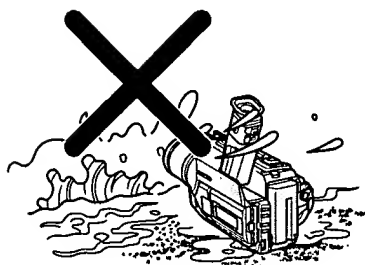
Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Precautions on camcorder care

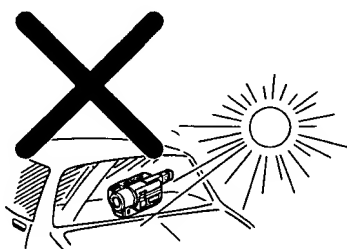
- The LCD screen and the viewfinder are manufactured using high-precision technology. However, there may be some tiny black points and/or bright points (red, blue, green or white) that constantly appear on the LCD screen and in the viewfinder. These points occur normally in the manufacturing process and do not affect the recorded picture in any way. Effective ratio of pixels and/or screen are 99.99% or more.
- Do not let your camcorder get wet. Keep your camcorder away from rain and sea water. Letting your camcorder get wet may cause your camcorder to malfunction. Sometimes this malfunction cannot be repaired [a].
- Never leave your camcorder exposed to temperatures above 60°C (140°F), such as in a car parked in the sun or under direct sunlight [b].
- Do not place your camcorder so as to point the viewfinder, the LCD screen or lens toward the sun. The inside of the viewfinder, LCD screen or lens may be damaged [c].

Getting started

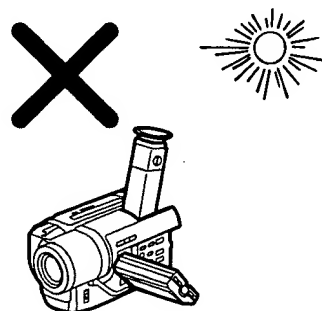
[a]



[b]

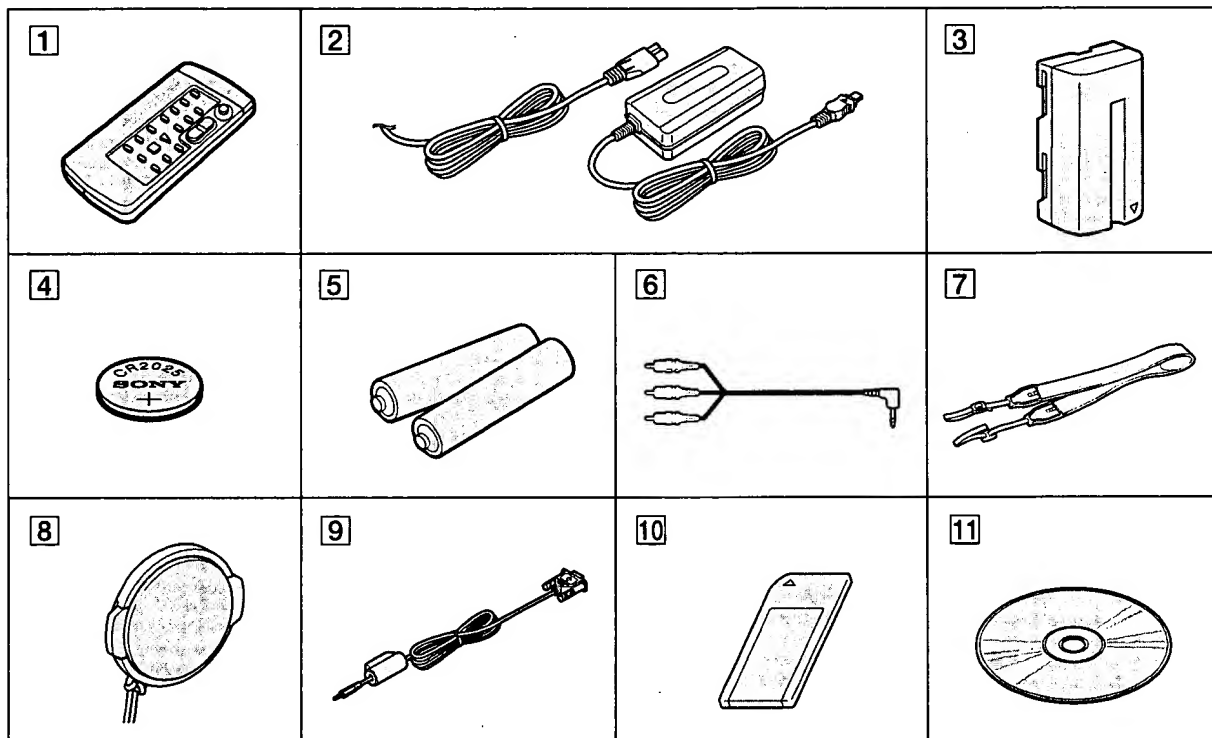


[c]



Checking supplied accessories

Make sure that the following accessories are supplied with your camcorder.



1 Wireless Remote Commander (1)
(p. 127)

2 AC-L10A/L10B/L10C AC power
adaptor (1), Power cord (1) (p. 10)

3 NP-F330 battery pack (1) (p. 9, 10)

4 CR2025 lithium battery (1) (p. 105)
The lithium battery is already installed
in your camcorder.

5 R6 (Size AA) battery for Remote
Commander (2) (p. 127)

6 A/V connecting cable (1) (p. 26)

7 Shoulder strap (1) (p. 124)

8 Lens cap (1) (p. 15)

9 PC serial cable (1) (p. 90)
DCR-TRV320 only

10 "Memory Stick" (1) (p. 71)
DCR-TRV320 only

11 Application software: PictureGear 4.1
Lite (CD-ROM) (1) (p. 90)
DCR-TRV320 only

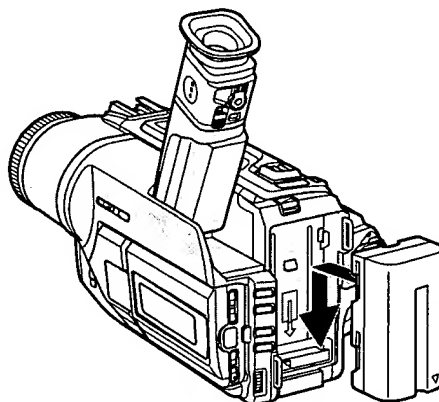
Contents of the recording cannot be compensated if recording or playback is not made due to a malfunction of the camcorder, video tape, etc.

Step 1 Preparing the power supply

Installing the battery pack

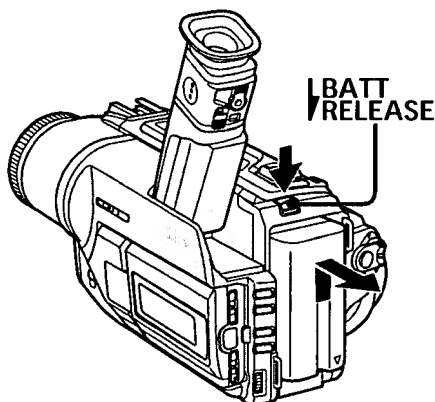
Install the battery pack to use your camcorder outdoors.

Slide the battery pack down until it clicks.



To remove the battery pack

Slide the battery pack out in the direction of the arrow while pressing **BATT RELEASE** down.



After installing the battery pack

Do not carry your camcorder by holding the battery pack. If you do so, the battery pack may slide off your camcorder unintentionally, damaging your camcorder.


Step 1 Preparing the power supply

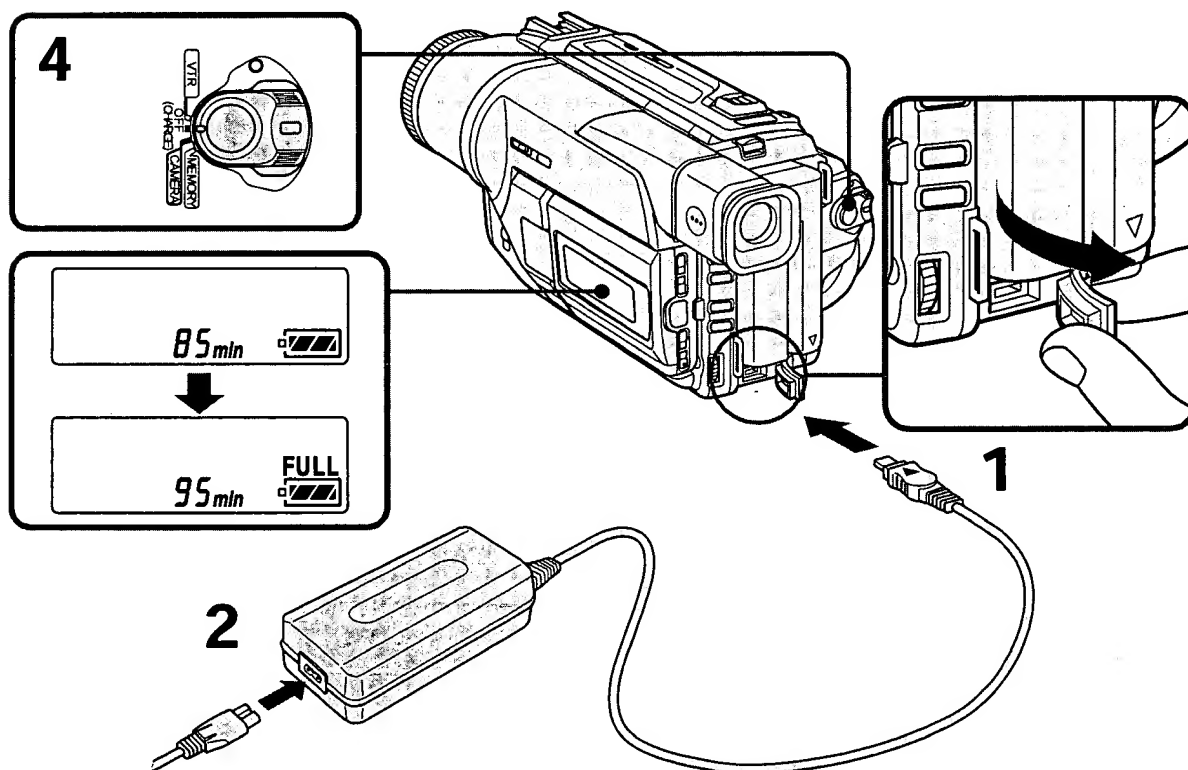
Charging the battery pack

Use the battery pack after charging it for your camcorder.

Your camcorder operates only with the "InfoLITHIUM" battery pack (L series).

- (1) Open the DC IN jack cover and connect the AC power adaptor supplied with your camcorder to the DC IN jack with the plug's ▲ mark facing up.
- (2) Connect the power cord to the AC power adaptor.
- (3) Connect the power cord to a wall outlet.
- (4) Set the POWER switch to OFF (CHARGE). Charging begins. The remaining battery time is indicated in minutes on the display window.

When the remaining battery indicator changes to , **normal charge** is completed. To fully charge the battery (**full charge**), leave the battery pack attached for about 1 hour after normal charge is completed until FULL appears in the display window. Fully charging the battery allows you to use the battery longer than usual.



After charging the battery pack

Disconnect the AC power adaptor from the DC IN jack on your camcorder.

Notes

- Prevent metallic objects from coming into contact with the metal parts of the DC plug of the AC power adaptor. This may cause a short-circuit, damaging the AC power adaptor.
- Keep the battery pack dry.
- When the battery pack is not to be used for a long time, charge the battery pack once fully, and then use it until it fully discharges again. Keep the battery pack in a cool place.

When the battery pack is charged fully

The LCD backlight of the display window is turned off.

Remaining battery time indicator

The remaining battery time indicator in the display window roughly indicates the recording time with the viewfinder.

Battery pack

The supplied battery pack is charged a little.

Step 1 Preparing the power supply

Until your camcorder calculates the actual remaining battery time
“- - - - min” appears in the display window.

While charging the battery pack, no indicator appears or the indicator flashes in the display window in the following cases:

- The battery pack is not installed correctly.
- The AC power adaptor is disconnected.
- Something is wrong with the battery pack.

Charging time

Battery pack	Full charge (Normal charge)
NP-F330 (supplied)	150 (90)
NP-F530/F550	210 (150)
NP-F730/F750	300 (240)
NP-F930/F950	390 (330)
NP-F960	420 (360)

Approximate number of minutes to charge an empty battery pack

Recording time

DCR-TRV120

Battery pack	Recording with the viewfinder		Recording with the LCD screen	
	Continuous*	Typical**	Continuous*	Typical**
NP-F330 (supplied)	100 (90)	55 (50)	90 (80)	50 (45)
NP-F530	170 (155)	95 (90)	150 (135)	85 (75)
NP-F550	205 (185)	115 (105)	185 (165)	105 (95)
NP-F730	350 (310)	200 (175)	305 (275)	175 (155)
NP-F750	425 (380)	240 (215)	375 (335)	215 (190)
NP-F930	555 (500)	315 (285)	480 (435)	275 (250)
NP-F950	650 (590)	370 (335)	570 (515)	325 (295)
NP-F960	765 (685)	435 (390)	680 (610)	385 (345)

DCR-TRV320

Battery pack	Recording with the viewfinder		Recording with the LCD screen	
	Continuous*	Typical**	Continuous*	Typical**
NP-F330 (supplied)	95 (85)	55 (50)	80 (70)	45 (40)
NP-F530	160 (145)	90 (80)	130 (115)	75 (65)
NP-F550	195 (175)	110 (100)	165 (145)	95 (80)
NP-F730	325 (290)	185 (165)	280 (250)	160 (140)
NP-F750	395 (355)	225 (200)	335 (295)	190 (170)
NP-F930	515 (465)	295 (265)	435 (390)	245 (220)
NP-F950	610 (550)	345 (315)	510 (460)	290 (260)
NP-F960	720 (645)	410 (365)	610 (550)	345 (315)

Approximate number of minutes when you use a fully charged battery

Numbers in parentheses “()” indicate the time using a normally charged battery.

* Approximate continuous recording time at 25°C (77°F). The battery life will be shorter if you use your camcorder in a cold environment.

** Approximate number of minutes when recording while you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.

Step 1 Preparing the power supply

Playing time

DCR-TRV120

Battery pack	Playing time on LCD screen	Playing time with LCD closed
NP-F330 (supplied)	90 (80)	100 (90)
NP-F530	145 (130)	165 (150)
NP-F550	175 (160)	200 (180)
NP-F730	300 (270)	335 (300)
NP-F750	365 (325)	410 (365)
NP-F930	475 (430)	535 (480)
NP-F950	555 (500)	630 (570)
NP-F960	660 (590)	740 (665)

DCR-TRV320

Battery pack	Playing time on LCD screen	Playing time with LCD closed
NP-F330 (supplied)	80 (70)	95 (85)
NP-F530	125 (115)	155 (140)
NP-F550	155 (140)	190 (170)
NP-F730	275 (250)	315 (285)
NP-F750	325 (285)	385 (345)
NP-F930	430 (385)	495 (450)
NP-F950	495 (450)	590 (530)
NP-F960	595 (535)	700 (630)

Approximate number of minutes when you use a fully charged battery

Numbers in parentheses “()” indicate the time using a normally charged battery. The battery life will be shorter if you use your camcorder in a cold environment.


The remaining battery time indicator

The indicator may not be correct, depending on the conditions in which you are recording. When you close the LCD panel and open it again, it takes about 1 minute for the correct remaining battery time to be displayed.

If the power may go off although the battery remaining indicator indicates that the battery pack has enough power to operate

Charge the battery pack fully again so that the indication on the battery remaining indicator is correct.

What is “InfoLITHIUM”?

The “InfoLITHIUM” is a lithium ion battery pack which can exchange data such as battery consumption with compatible electronic equipment. This unit is compatible with the “InfoLITHIUM” battery pack (L series). Your camcorder operates only with the “InfoLITHIUM” battery. “InfoLITHIUM” battery packs have the  **InfoLITHIUM** mark. “InfoLITHIUM” is a trademark of Sony Corporation.

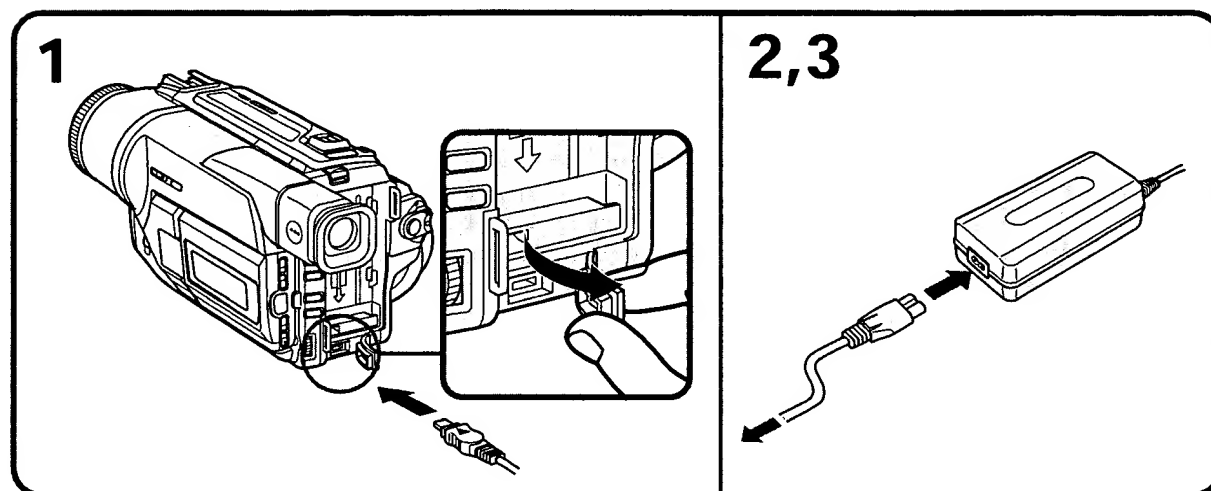
Step 1 Preparing the power supply

Connecting to a wall outlet

When you use your camcorder for a long time, we recommend that you power it from a wall outlet using the AC power adaptor.

- (1) Open the DC IN jack cover, and connect the AC power adaptor to the DC IN jack on your camcorder with the plug's ▲ mark facing up.
- (2) Connect the power cord to the AC power adaptor.
- (3) Connect the power cord to a wall outlet.

Getting started



PRECAUTION

The set is not disconnected from the AC power source (house current) as long as it is connected to the wall outlet, even if the set itself has been turned off.

Notes

- The AC power adaptor can supply power even if the battery pack is attached to your camcorder.
- The DC IN jack has "source priority". This means that the battery pack cannot supply any power if the power cord is connected to the DC IN jack, even when the power cord is not plugged into a wall outlet.

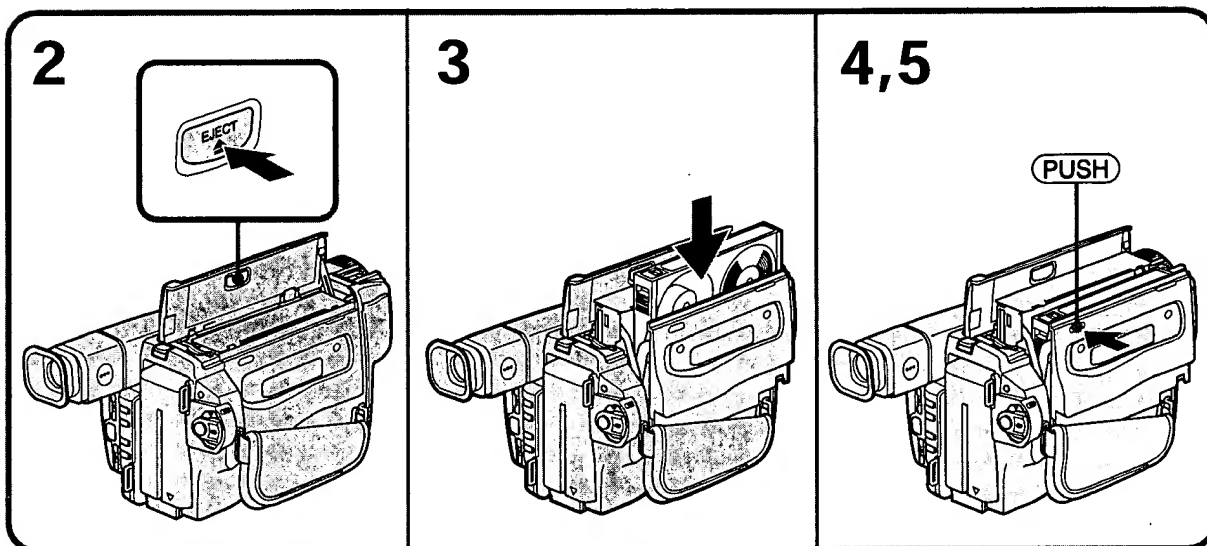
Using a car battery

Use Sony DC Adaptor/Charger (not supplied).

Step 2 Inserting a cassette

We recommend using Hi8 **Hi8**/Digital8 **D** video cassettes.

- (1) Prepare the power supply (p. 9).
- (2) Open the lid of the cassette compartment, and press EJECT. The cassette compartment opens automatically.
- (3) Insert a cassette with its window facing out and the write-protect tab on the cassette up.
- (4) Close the cassette compartment by pressing the **PUSH** mark on the cassette compartment. The cassette compartment automatically goes down.
- (5) Close the lid of the cassette compartment.

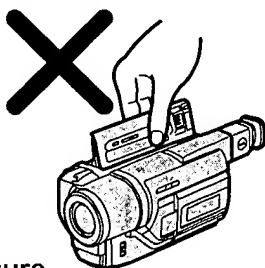


To eject a cassette

Follow the procedure above, and eject the cassette in step 3.

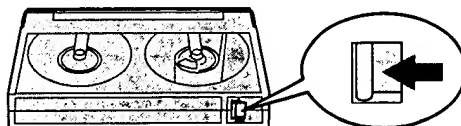
Notes

- Do not press the cassette compartment down. Doing so may cause malfunction.
- Your camcorder records pictures in the Digital8 **D** system.
- The recording time when you use your camcorder is half of indicated time on Hi8 **Hi8** tape. If you select the LP mode in the menu settings, 3/4 of indicated time on Hi8 **Hi8** tape.
- If you use standard 8 **8** tape, be sure to play back the tape on this camcorder. Mosaic pattern noise may appear when you play back standard 8 **8** tape on other camcorders (including other DCR-TRV120/TRV320).
- The cassette compartment may not be closed when you press any part of the lid other than the **PUSH** mark.
- Do not pick up your camcorder by holding the lid of the cassette compartment.



To prevent accidental erasure

Slide the write-protect tab on the cassette to expose the red mark.

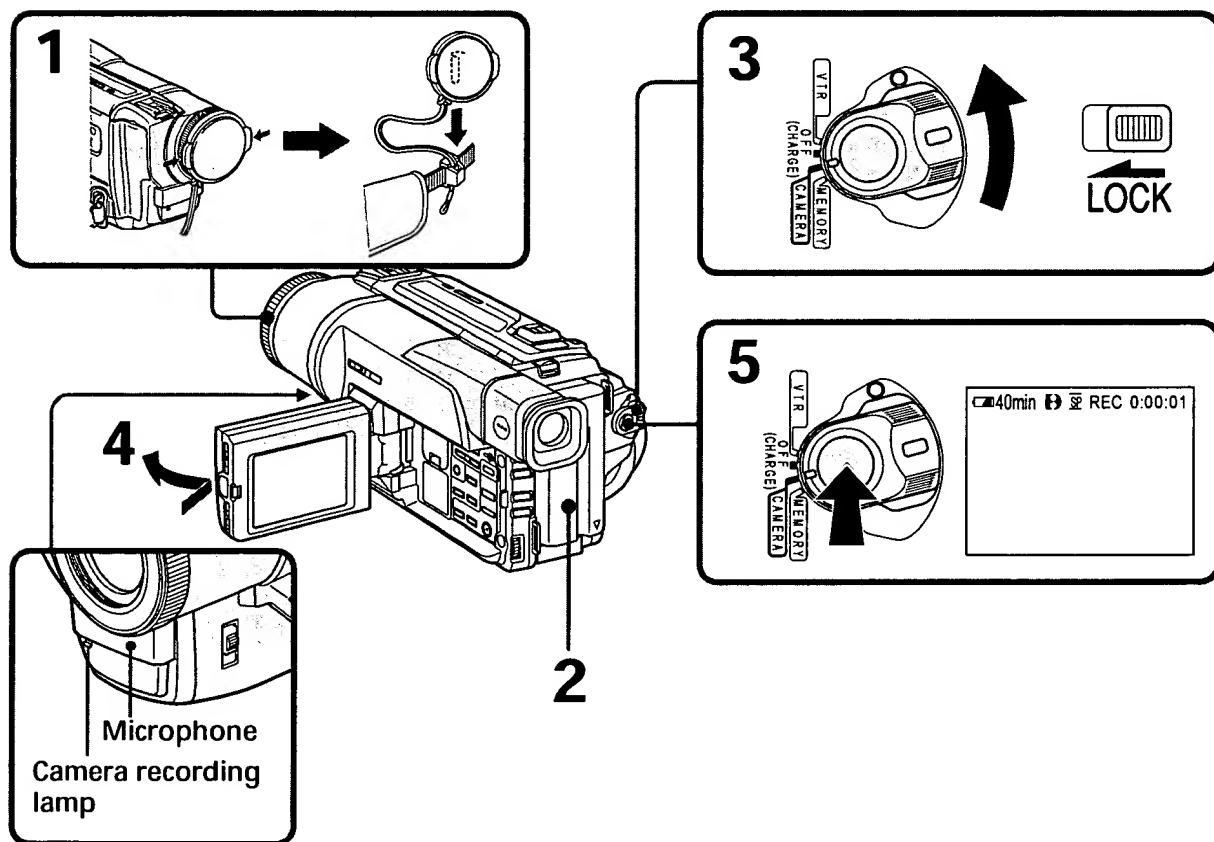


Recording a picture

Your camcorder automatically focuses for you.

- (1) Remove the lens cap by pressing both knobs on its sides and attach the lens cap to the grip strap.
- (2) Install the power source and insert a cassette. See “Step 1” and “Step 2” for more information (p. 9 to 14).
- (3) Set the POWER switch to CAMERA while pressing the small green button. Your camcorder is set to the standby mode.
- (4) Open the LCD panel while pressing OPEN. The viewfinder automatically turns off.
- (5) Press START/STOP. Your camcorder starts recording. The REC indicator appears. The camera recording lamp located on the front of your camcorder lights up. To stop recording, press START/STOP again. The recording lamp lights up in the viewfinder when you record with the viewfinder.

Recording - Basics



Notes

- Fasten the grip strap firmly.
- Do not touch the built-in microphone during recording.

Note on Recording mode

Your camcorder records and plays back in the SP (standard play) mode and in the LP (long play) mode. Select SP or LP in the menu settings (p 63). In the LP mode, you can record 1.5 times as long as in the SP mode. When you record a tape in the LP mode on your camcorder, we recommend that you play back the tape on your camcorder.

Recording a picture

Note on LOCK (DCR-TRV320 only)

When you slide LOCK to the left, the POWER switch can no longer be set to MEMORY accidentally. The LOCK is released as a default setting.

To enable smooth transition

You can make the transition between the last scene you recorded and the next scene smooth as long as you do not eject the cassette if you turn off your camcorder. When you change the battery pack, set the POWER switch to OFF (CHARGE).

If you leave your camcorder in the standby mode for 3 minutes

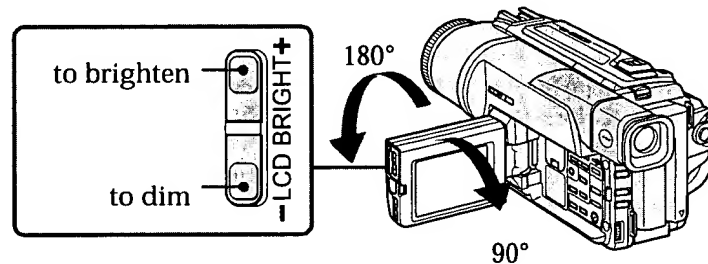
Your camcorder automatically turns off. This is to save battery power and to prevent battery and tape wear. To resume the standby mode, set the POWER switch to OFF (CHARGE) once, then turn it to CAMERA again.

Adjusting the LCD screen

To adjust the brightness of the LCD screen, press either of the two buttons on LCD BRIGHT.

The LCD panel moves about 90 degrees to the viewfinder side and about 180 degrees to the lens side.

If you turn the LCD panel over so that it faces the other way, the ☺ indicator appears on the LCD screen and in the viewfinder (**Mirror mode**).



When closing the LCD panel, set it vertically until it clicks, and swing it into the camcorder body.

Note

When using the LCD screen except in the mirror mode, the viewfinder automatically turns off.

When you use the LCD screen outdoors in direct sunlight

The LCD screen may be difficult to see. If this happens, we recommend that you use the viewfinder.

Picture in the mirror mode

The picture on the LCD is a mirror-image. However, the picture will be normal when recorded.

During recording in the mirror mode

You cannot operate the ZERO SET MEMORY on the Remote Commander.

Indicators in the mirror mode

The STBY indicator appears as **II●** and REC as **●**. Some of other indicators appear mirror-reversed and others are not displayed.

Recording a picture

After recording

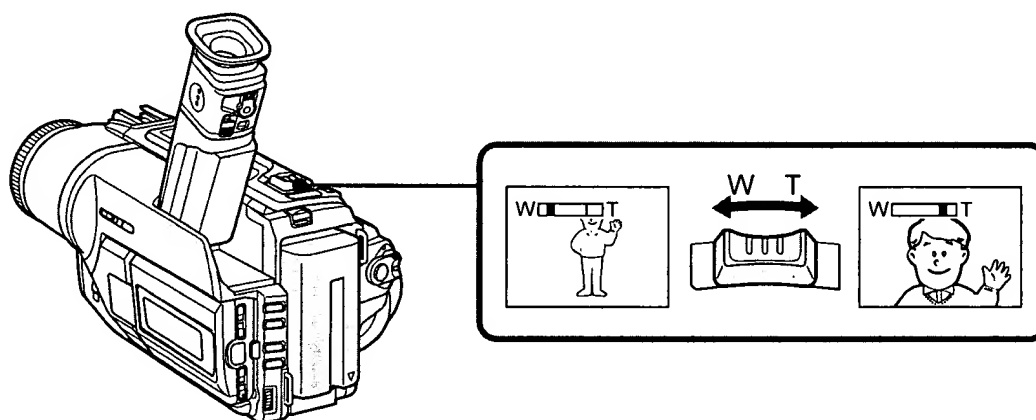
- (1) Set the POWER switch to OFF (CHARGE).
- (2) Close the LCD panel.
- (3) Eject the cassette.

Using the zoom feature

Move the power zoom lever a little for a slower zoom. Move it further for a faster zoom. Using the zoom function sparingly results in better-looking recordings.

"T" side: for telephoto (subject appears closer)

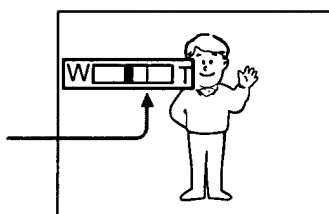
"W" side: for wide-angle (subject appears farther away)



Zoom greater than 25 \times is performed digitally. To activate digital zoom, select the digital zoom power in D ZOOM in the menu settings. (p. 63)

The picture quality deteriorates as the picture is processed digitally.

The right side of the bar shows the digital zooming zone.
The digital zooming zone appears when you select the digital zoom power in D ZOOM in the menu settings.



Notes on digital zoom

- Digital zoom starts to function when zoom exceeds 25 \times .
- The picture quality deteriorates as you go toward the "T" side. Set D ZOOM to OFF in the menu settings. Otherwise the digital zoom activates without notice.

When you shoot close to a subject

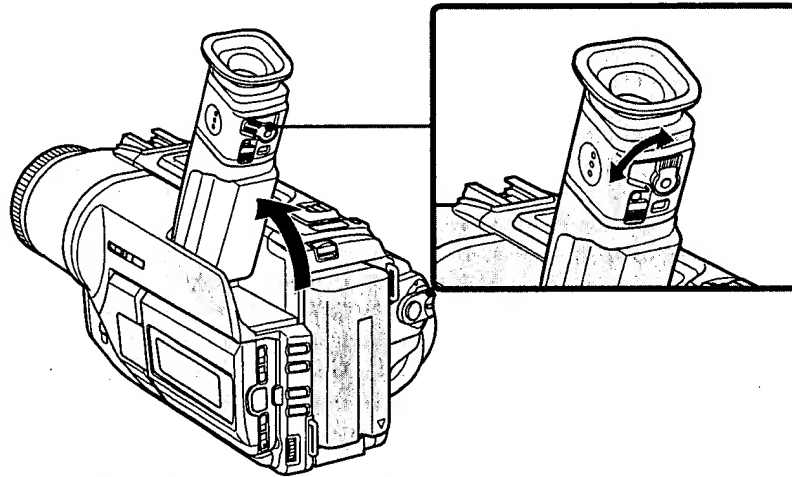
If you cannot get a sharp focus, move the power zoom lever to the "W" side until the focus is sharp. You can shoot a subject that is at least about 80 cm (2 feet 5/8 inch) away from the lens surface in the telephoto position, or about 1 cm (1/2 inch) away in the wide-angle position.

Recording a picture

To record pictures with the viewfinder - adjusting the viewfinder

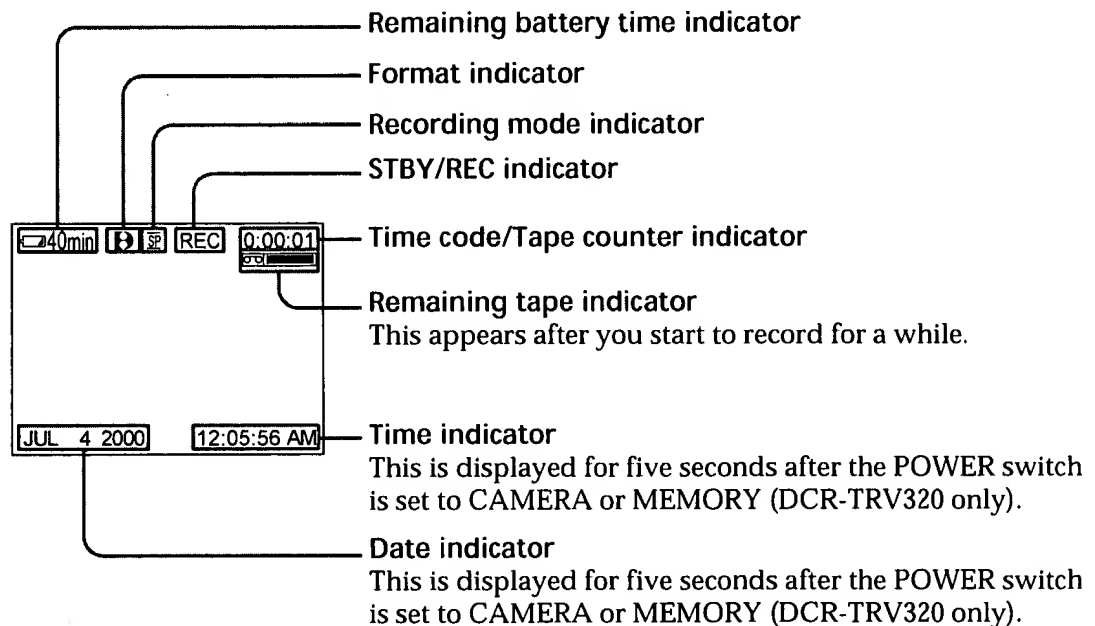
If you record pictures with the LCD panel closed, check the picture with the viewfinder. Adjust the viewfinder lens to your eyesight so that the indicators in the viewfinder come into sharp focus.

Lift up the viewfinder and move the viewfinder lens adjustment lever.



Indicators displayed in the recording mode

The indicators are not recorded on tape.



Time code (for tapes recorded in the Digital8 **B** system only)

The time code indicates the recording or playback time, "0:00:00" (hours:minutes:seconds) in CAMERA mode and "0:00:00:00" (hours:minutes:seconds:frames) in VTR mode. You cannot rewrite only the time code.


When you play back tapes recorded in the Hi8/standard 8 system, the tape counter appears.

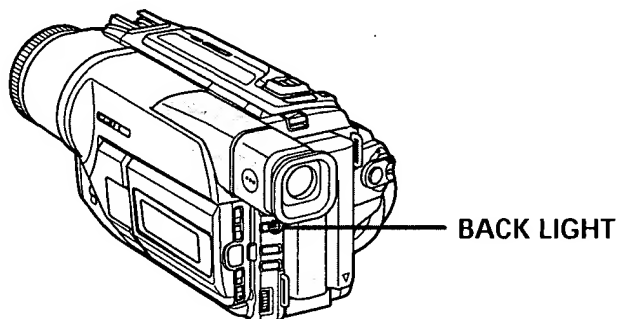
You cannot reset the time code or the tape counter.

Recording a picture

Shooting backlit subjects - BACK LIGHT

When you shoot a subject with the light source behind the subject or a subject with a light background, use the backlight function.

Press BACK LIGHT in CAMERA or MEMORY (DCR-TRV320 only) mode.
The  indicator appears on the LCD screen or in the viewfinder.
To cancel, press BACK LIGHT again.




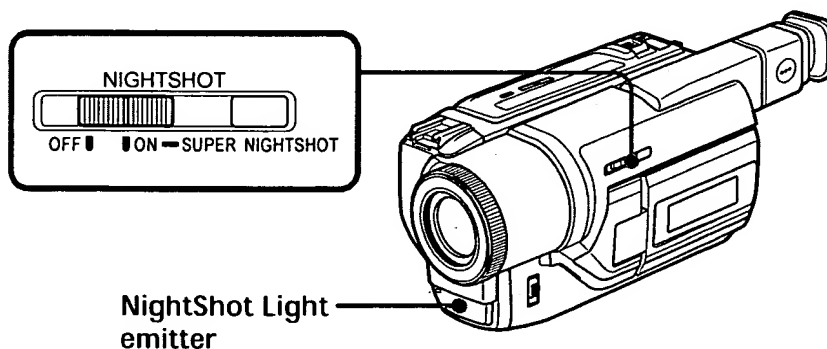
If you press EXPOSURE when shooting backlit subjects
The backlight function will be canceled.

Shooting in the dark - NightShot/Super NightShot

The NightShot function enables you to shoot a subject in a dark place. For example, you can satisfactorily record the environment of nocturnal animals for observation when you use this function.

While your camcorder is in CAMERA or MEMORY (DCR-TRV320 only) mode, slide NIGHTSHOT to ON.



 and "NIGHTSHOT" indicators flash on the LCD screen or in the viewfinder.
To cancel the NightShot function, slide NIGHTSHOT to OFF.



Recording a picture

Using SUPER NIGHTSHOT

The Super NightShot mode makes subjects up to 16 times brighter than those recorded in the NightShot mode.

- (1) Slide NIGHTSHOT to ON in CAMERA mode.  and "NIGHTSHOT" indicators flash on the LCD screen or in the viewfinder.
 - (2) Press SUPER NIGHTSHOT.  and "SUPER NIGHTSHOT" indicators flash on the LCD screen or in the viewfinder.
- To cancel the Super NightShot mode, press SUPER NIGHTSHOT again.

Using the NightShot Light

The picture will be clearer with the NightShot Light on. To enable NightShot Light, set N.S.LIGHT to ON in the menu settings (p. 63).

Notes

- Do not use the NightShot function in bright places (ex. outdoors in the daytime). This may cause your camcorder to malfunction.
- When you keep NIGHTSHOT set to ON in normal recording, the picture may be recorded in incorrect or unnatural colors.
- If focusing is difficult with the autofocus mode when using the NightShot function, focus manually.

While using the NightShot function, you can not use the following functions:

- Exposure
- PROGRAM AE

While using the Super NightShot function, you can not use the following functions:

- Fader
- Digital effect
- Exposure
- PROGRAM AE

Shutter speed in the Super NightShot mode

The shutter speed will be automatically changed depending on the brightness of the background. The motion of the picture will be slow.

NightShot Light



NightShot Light rays are infrared and so are invisible. The maximum shooting distance using the NightShot Light is about 3 m (10 feet).

Recording a picture

Self-timer recording

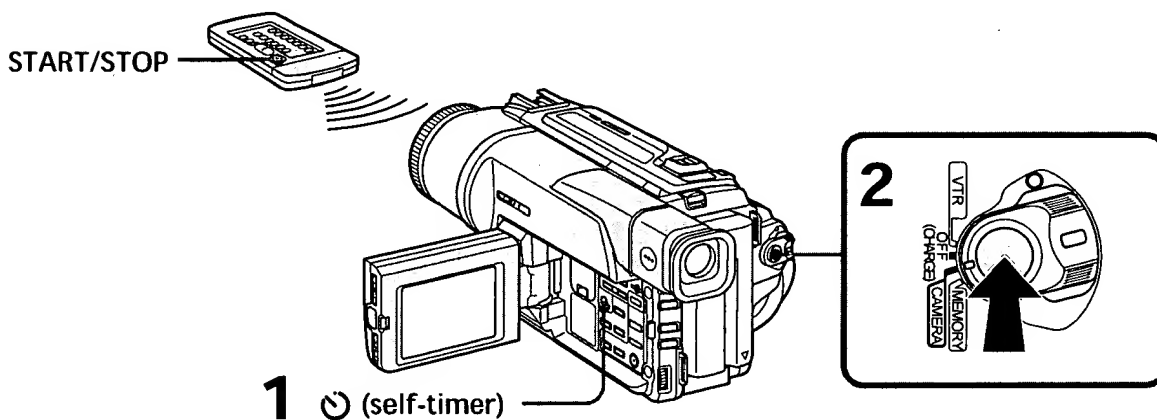
– DCR-TRV320 only

Recording with the self-timer starts in 10 seconds automatically. This mode is useful when you want to record yourself. You can also use the Remote Commander for this operation.

(1) Press  (self-timer) in the standby mode. The  (self-timer) indicator appears on the LCD screen or in the viewfinder.

(2) Press START/STOP.

Self-timer starts counting down from 10 with a beep sound. In the last two seconds of the countdown, the beep sound gets faster, then recording starts automatically.



To stop the self-timer recording



Press START/STOP.

Use the Remote Commander for convenience.

To record still images using the self-timer

Press PHOTO in step 2. (P. 29)

To cancel self-timer recording

Press  (self-timer) so that the  indicator disappears from the LCD or viewfinder screen while your camcorder is in the standby mode.

Note

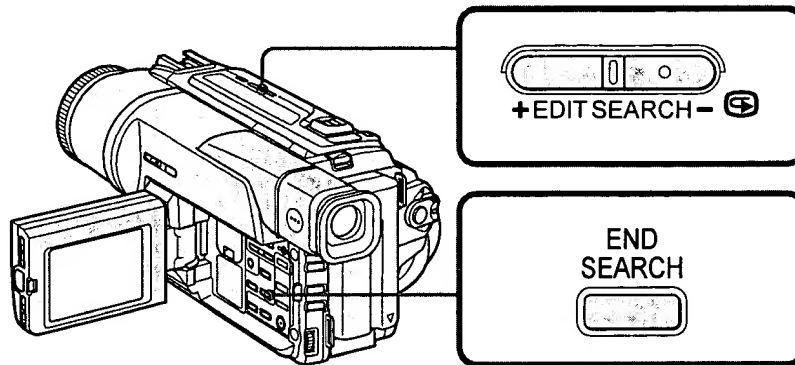
The self-timer recording mode is automatically cancelled when:

- Self-timer recording is finished.
- The POWER switch is set to OFF (CHARGE) or VTR.

Checking the recording

- END SEARCH/EDITSEARCH/Rec Review

You can use these buttons to check the recorded picture or shoot so that the transition between the last recorded scene and the next scene you record is smooth.



END SEARCH

You can go to the end of the recorded section after you record.

Press END SEARCH in the standby mode.

The last 5 seconds of the recorded section are played back and returns to the standby mode. You can monitor the sound from the speaker or headphones.

EDITSEARCH

You can search for the next recording start point.

Hold down the +/- (⊞) side of EDITSEARCH in the standby mode. The recorded section is played back.

+ : to go forward

- : to go backward

Release EDITSEARCH to stop playback. If you press START/STOP, re-recording begins from the point you released EDITSEARCH. You cannot monitor the sound.


Rec Review

You can check the section which you have stopped most recently.

Press the - (⊞) side of EDITSEARCH momentarily in the standby mode.

The section you have stopped most recently will be played back for a few seconds, and then your camcorder will return to the standby mode. You can monitor the sound from the speaker or headphones.

Notes

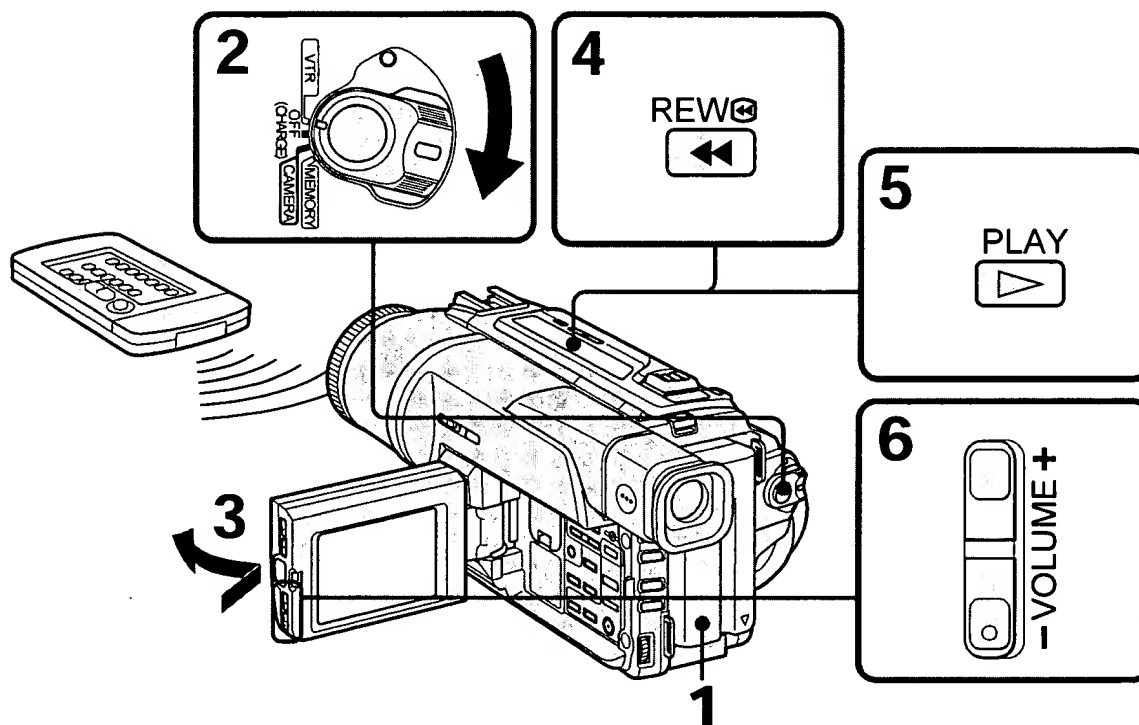
- END SEARCH, EDITSEARCH and Rec Review work only for tapes recorded in the Digital8  system.
- If you start recording after using the end search function, occasionally, the transition between the last scene you recorded and the next scene may not be smooth.
- Once you eject the cassette after you have recorded on the tape, the end search function does not work.

If a tape has a blank portion in the recorded portions
The end search function may not work correctly.

Playing back a tape

You can monitor the playback picture on the LCD screen. If you close the LCD panel, you can monitor the playback picture in the viewfinder. You can control playback using the Remote Commander supplied with your camcorder.

- (1) Install the power source and insert the recorded tape.
- (2) Set the POWER switch to VTR while pressing the small green button. The video control buttons light up.
- (3) Open the LCD panel while pressing OPEN.
- (4) Press ◀◀ to rewind the tape.
- (5) Press ▶ to start playback.
- (6) To adjust the volume, press either of the two buttons on VOLUME. The speaker on your camcorder is silent when the LCD panel is closed.

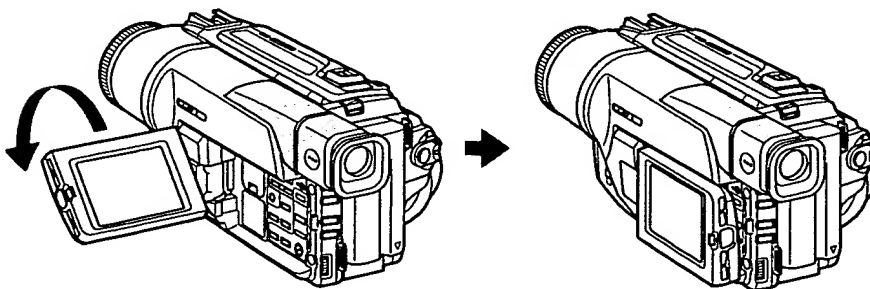


To stop playback

Press ■.

When monitoring on the LCD screen

You can turn the LCD panel over and move it back to the camcorder body with the LCD screen facing out.



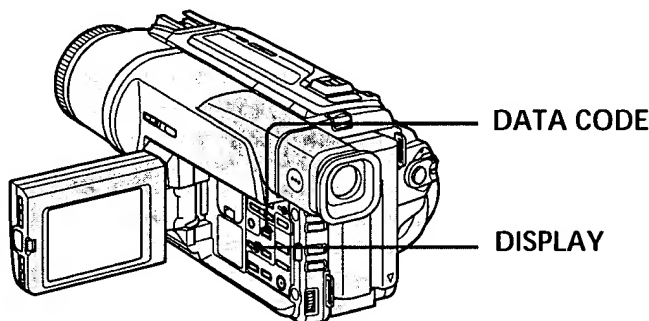
Playing back a tape

To display the screen indicators - Display function

Press DISPLAY on your camcorder or the Remote Commander supplied with your camcorder.

The indicators appear on the LCD screen.

To make the indicators disappear, press DISPLAY again.



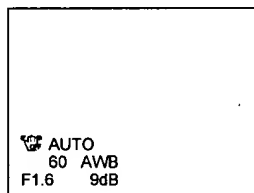
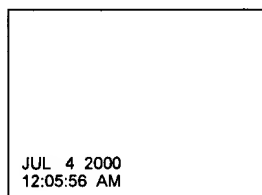
Using the data code function

Your camcorder automatically records not only images on the tape but also the recording data (date/time or various settings when recorded) (**Data code**).

Press DATA CODE on your camcorder or the Remote Commander in the playback mode.

The display changes as follows:

date/time → various settings (SteadyShot, exposure AUTO/MANUAL, white balance, gain, shutter speed, aperture value) → no indicator



Not to display recording date

Set DATA CODE to DATE in the menu settings (p. 63).

The display changes as follows:

date/time → no indicator

Notes on the data code function

- The data code function works only for tapes recorded in the Digital8 **B** system.
- Various settings of the recording data are not recorded when recording images on "Memory Stick". (DCR-TRV320 only)

Recording data

Recording data is your camcorder's information when you have recorded. In the recording mode, the recording data will not be displayed.

When you use data code function, bars (--- -- ---- and ---:---) appear if:

- A blank section of the tape is being played back.
- The tape is unreadable due to tape damage or noise.
- The tape was recorded by a camcorder without the date and time set.

Data code

When you connect your camcorder to the TV, the data code appears on the TV screen.

Playing back a tape

Various playback modes

To operate video control buttons, set the POWER switch to VTR.

To view a still image (playback pause)

Press **II** during playback. To resume playback, press **II** or **▶**.

To advance the tape

Press **▶▶** in the stop mode. To resume normal playback, press **▶**.

To rewind the tape

Press **◀◀** in the stop mode. To resume normal playback, press **▶**.

To change the playback direction

Press **<** on the Remote Commander during playback to reverse the playback direction. To resume normal playback, press **▶**.

To locate a scene monitoring the picture (picture search)

Keep pressing **◀◀** or **▶▶** during playback. To resume normal playback, release the button.

To monitor the high-speed picture while advancing or rewinding the tape (skip scan)

Keep pressing **◀◀** while rewinding or **▶▶** while advancing the tape. To resume rewinding or advancing, release the button.

To view the picture at slow speed (slow playback)

Press **■▶** on the Remote Commander during playback. For slow playback in the reverse direction, press **<**, then press **■▶** on the Remote Commander. To resume normal playback, press **▶**.

To view the picture at double speed

Press **×2** on the Remote Commander during playback. For double speed playback in the reverse direction, press **<**, then press **×2** on the Remote Commander. To resume normal playback, press **▶**.

To view the picture frame-by-frame

Press **II▶** on the Remote Commander in the playback pause mode. For frame-by-frame playback in the reverse direction, press **◀II**. To resume normal playback, press **▶**.

To search the last scene recorded (END SEARCH)

Press **END SEARCH** in the stop mode. The last 5 seconds of the recorded section plays back and stops.

In the various playback modes

- Noise may appear when your camcorder plays back tapes recorded in the Hi8/standard 8 system.
- Sound is muted.
- The previous recording may appear as a mosaic image when playing back in the Digital8 **D** system.

Notes on the playback pause mode

- When the playback pause mode lasts for 3 minutes, your camcorder automatically enters the stop mode. To resume playback, press **▶**.
- The previous recording may appear.

Slow playback for tapes recorded in the Digital8 **D** system

The slow playback can be performed smoothly on your camcorder; however, this function does not work for an output signal from the **i** DV IN/OUT jack.

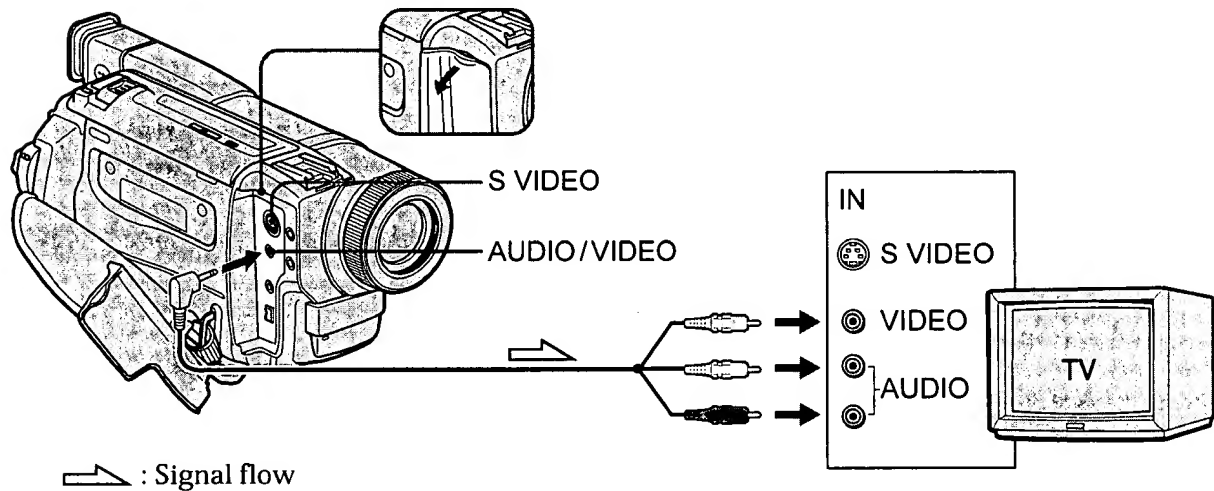
When you play back a tape in reverse

Horizontal noise may appear at the center or top and bottom of the screen. This is not a malfunction.

Viewing the recording on TV

Connect your camcorder to your TV or VCR with the A/V connecting cable supplied with your camcorder to watch the playback picture on the TV screen. You can operate the playback control buttons in the same way as when you monitor playback pictures on the LCD screen. When monitoring the playback picture on the TV screen, we recommend that you power your camcorder from a wall outlet using the AC power adaptor (p. 13). Refer to the operating instructions of your TV or VCR.

Open the jack cover. Connect your camcorder to the TV using the A/V connecting cable. Then, set the TV/VCR selector on the TV to VCR.



If your TV is already connected to a VCR

Connect your camcorder to the LINE IN input on the VCR by using the A/V connecting cable supplied with your camcorder. Set the input selector on the VCR to LINE.

If your TV or VCR is a monaural type

Connect the yellow plug of the A/V connecting cable to the video input jack and the white or the red plug to the audio input jack on the VCR or the TV. If you connect the white plug, the sound is L (left) signal. If you connect the red plug, the sound is R (right) signal.

If your TV or VCR has an S video jack

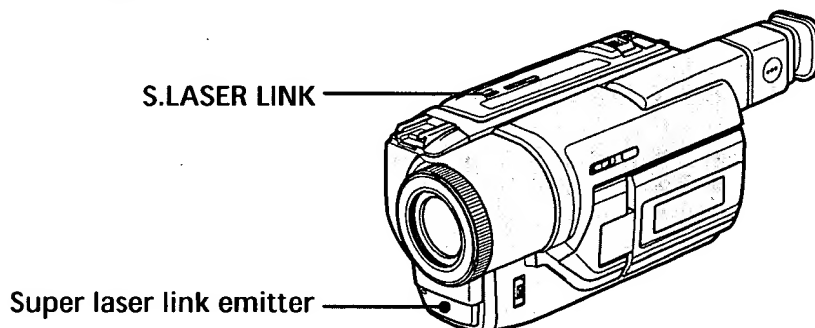
Connect using an S video cable (not supplied) to obtain high-quality pictures. With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.

Connect an S video cable (not supplied) to the S video jacks on both your camcorder and the TV or the VCR.

Viewing the recording on TV

Using the AV cordless IR receiver

Once you connect the AV cordless IR receiver (not supplied) to your TV or VCR, you can easily view the picture on your TV. For details, refer to the operating instructions of the AV cordless IR receiver.

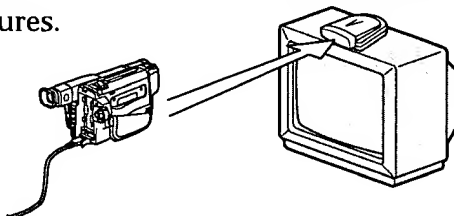


Playback - Basics

Before operation

Attach the power supply such as the AC power adaptor to your camcorder, and insert the recorded tape.

- (1) After connecting your TV and AV cordless IR receiver, set the POWER switch on the AV cordless IR receiver to ON.
- (2) Turn the TV on and set the TV/VCR selector on the TV to VCR.
- (3) Set the POWER switch on your camcorder to VTR.
- (4) Press S.LASER LINK. The lamp of S.LASER LINK lights up.
- (5) Press ► on your camcorder to start playback.
- (6) Point the super laser link emitter at the AV cordless IR receiver. Adjust the position of your camcorder and the AV cordless IR receiver to obtain clear playback pictures.



To cancel the super laser link function

Press S.LASER LINK. The lamp on the S.LASER LINK button goes out.

If you use a Sony TV

- You can turn on the TV automatically when you press S.LASER LINK on your camcorder. To do so, do as follows in advance:
 - Turn the TV's main switch on.
 - Set AUTO TV ON to ON in the menu settings.
 - Point the super laser link emitter of your camcorder at the TV's remote sensor.
- You can switch the video input of the TV automatically to the one which the AV cordless IR receiver is connected. To do so, set AUTO TV ON to ON and TV INPUT to the same video input (1, 2, 3) in the menu settings. With some models, however, the picture and sound may be disconnected momentarily when the video input is switched.
- The above feature may not work on some TV models.

If you turn the power off

Super laser link function turns off automatically.

When super laser link is activated (the S.LASER LINK button is lit)

Your camcorder consumes power. Press S.LASER LINK to turn off the super laser link function when it is not needed.

Recording a still image on a tape

- Tape Photo recording

You can record a still image like a photograph. This mode is useful when you want to record an image such as a photograph or when you print a picture using a video printer (not supplied).

You can record about 510 images in the SP mode and about 765 images in the LP mode on a tape which can record for 60 minutes in the SP mode.

Besides the operation described here, your camcorder can record still images on "Memory Stick"s (p. 71) (DCR-TRV320 only).

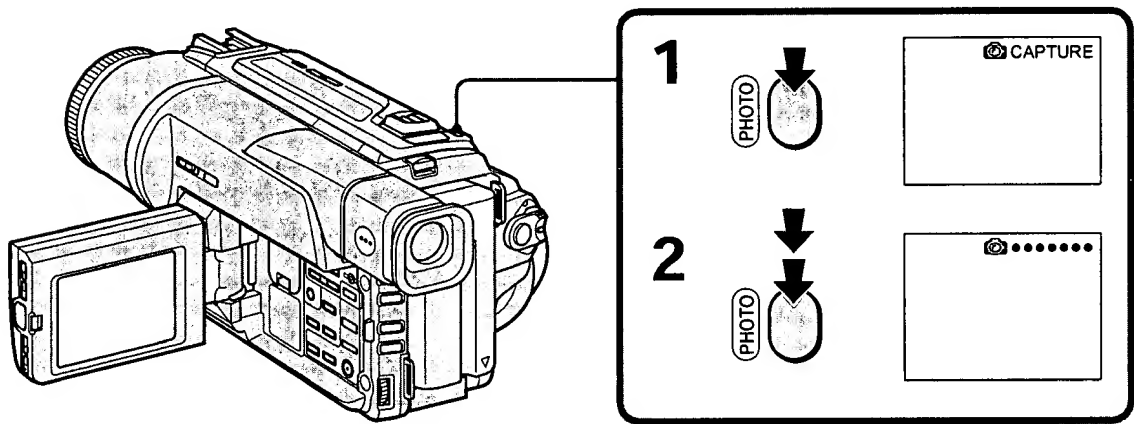
(1) In the standby mode, keep pressing PHOTO lightly until a still image appears. The CAPTURE indicator appears. Recording does not start yet.

To change the still image, release PHOTO, select a still image again, and then press and hold PHOTO lightly.

(2) Press PHOTO deeper.

The still image on the LCD screen or in the viewfinder is recorded for about seven seconds. The sound during those seven seconds is also recorded.

The still image is displayed on the LCD screen or in the viewfinder until recording is completed.



Notes

- During the tape photo recording, you cannot change the mode or setting.
- The PHOTO button does not work:
 - while the digital effect function is set or in use.
 - while the fader function is in use.
- When recording a still image, do not shake your camcorder. Mosaic-pattern noise may appear on the image.

To use tape photo recording function using the Remote Commander

Press PHOTO in the Remote Commander. Your camcorder records an image on the LCD screen or in the viewfinder immediately.

When you use the tape photo recording function during normal CAMERA recording



You cannot check an image on the LCD screen or in the viewfinder by pressing PHOTO lightly. Press PHOTO deeper. The still image is then recorded for about seven seconds, and your camcorder returns to the standby mode. During the seven seconds to record, you cannot shoot another still image.

Recording a still image on a tape – Tape Photo recording

Self-timer tape photo recording

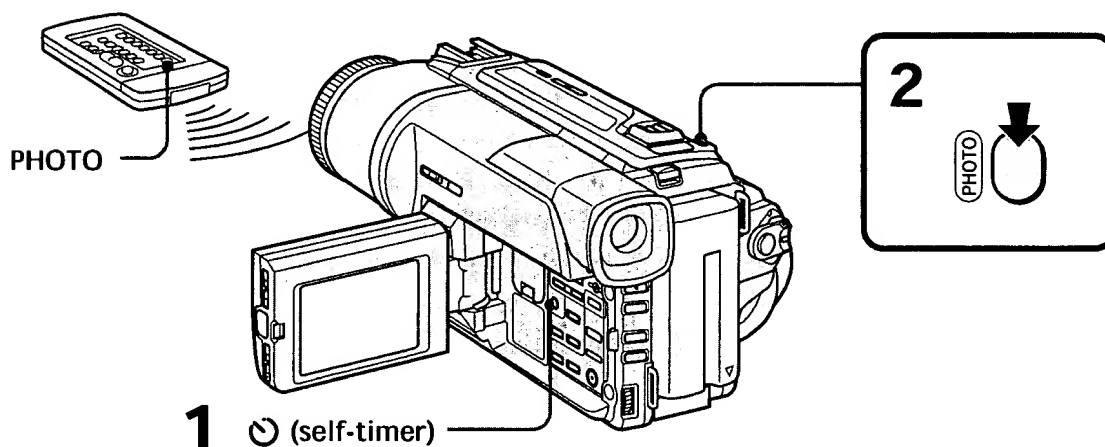
– DCR-TRV320 only

You can record still images on tapes with the self-timer. This mode is useful when you want to record yourself. You can also use the Remote Commander for this operation.



(1) In the standby mode, press  (self-timer). The  (self-timer) indicator appears on the LCD screen or in the viewfinder.

(2) Press PHOTO firmly.

Self-timer starts counting down from 10 with a beep sound. In the last two seconds of the countdown, the beep sound gets faster, then recording starts automatically.



To cancel self-timer recording

Press  (self-timer) so that the  indicator disappears from the LCD or viewfinder screen while your camcorder is in the standby mode. You cannot cancel self-timer recording with the Remote Commander.

Note

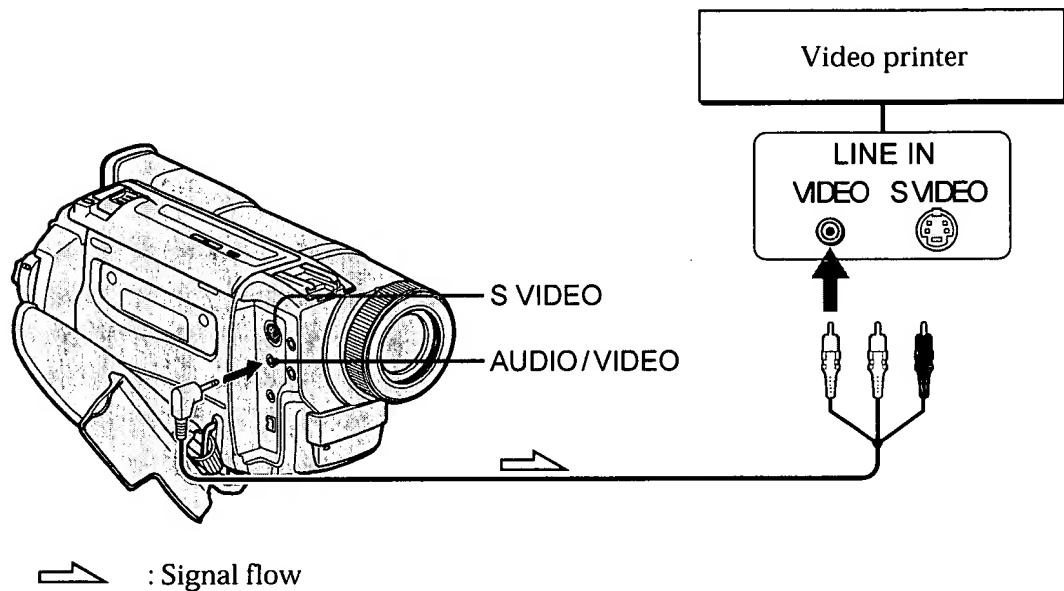
The self-timer recording mode is automatically cancelled when:

- Self-timer recording is finished.
- The POWER switch is set to OFF (CHARGE) or VTR.

Recording a still image on a tape – Tape Photo recording

Printing the still image

You can print a still image by using the video printer (not supplied). Connect the video printer using the A/V connecting cable supplied with your camcorder. Connect the A/V connecting cable to the AUDIO/VIDEO jack and connect the yellow plug of the cable to the video input of the video printer. Refer to the operating instructions of the video printer as well.

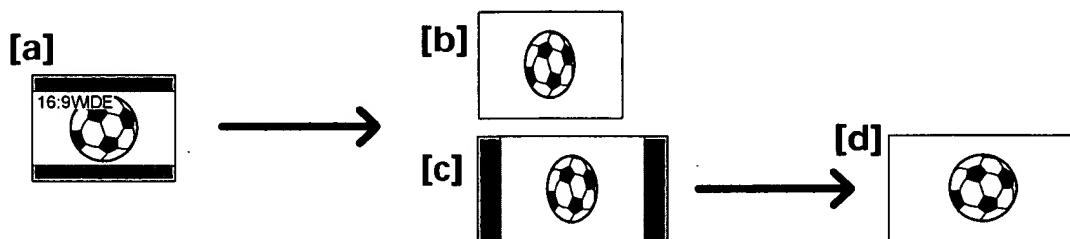


If the video printer is equipped with S video input

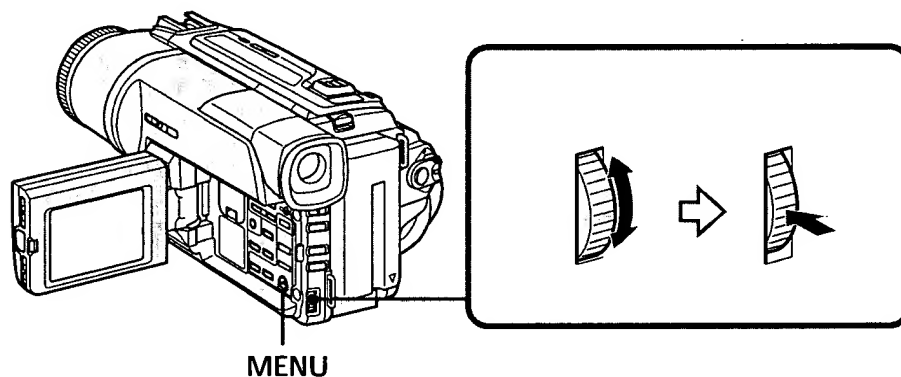
Use the S video connecting cable (not supplied). Connect it to the S VIDEO jack and the S video input of the video printer.

Using the wide mode

You can record a 16:9 wide picture to watch on the 16:9 wide-screen TV (16:9WIDE). Black bands appear on the LCD screen during recording in 16:9WIDE mode [a]. The picture during playing back in the viewfinder, on a normal TV [b] or a wide-screen TV [c] are compressed in the widthwise direction. If you set the screen mode of the wide-screen TV to the full mode, you can watch pictures of normal images [d].



In the standby mode, set 16:9WIDE to ON in the menu settings (p. 63).



To cancel the wide mode

Set 16:9WIDE to OFF in the menu settings.

In the wide mode, you cannot select the following functions:

- Old movie
- Bounce

During recording

You cannot select or cancel the wide mode. When you cancel the wide mode, set your camcorder to the standby mode and then set 16:9WIDE to OFF in the menu setting.

Connection for a TV

Pictures recorded in the 16:9WIDE mode automatically appear on the TV screen at full size when:

- you connect your camcorder to a TV that is compatible with the video ID (ID-1/ID-2) system.
- you connect your camcorder to the S video jack on the TV.

ID-2 system

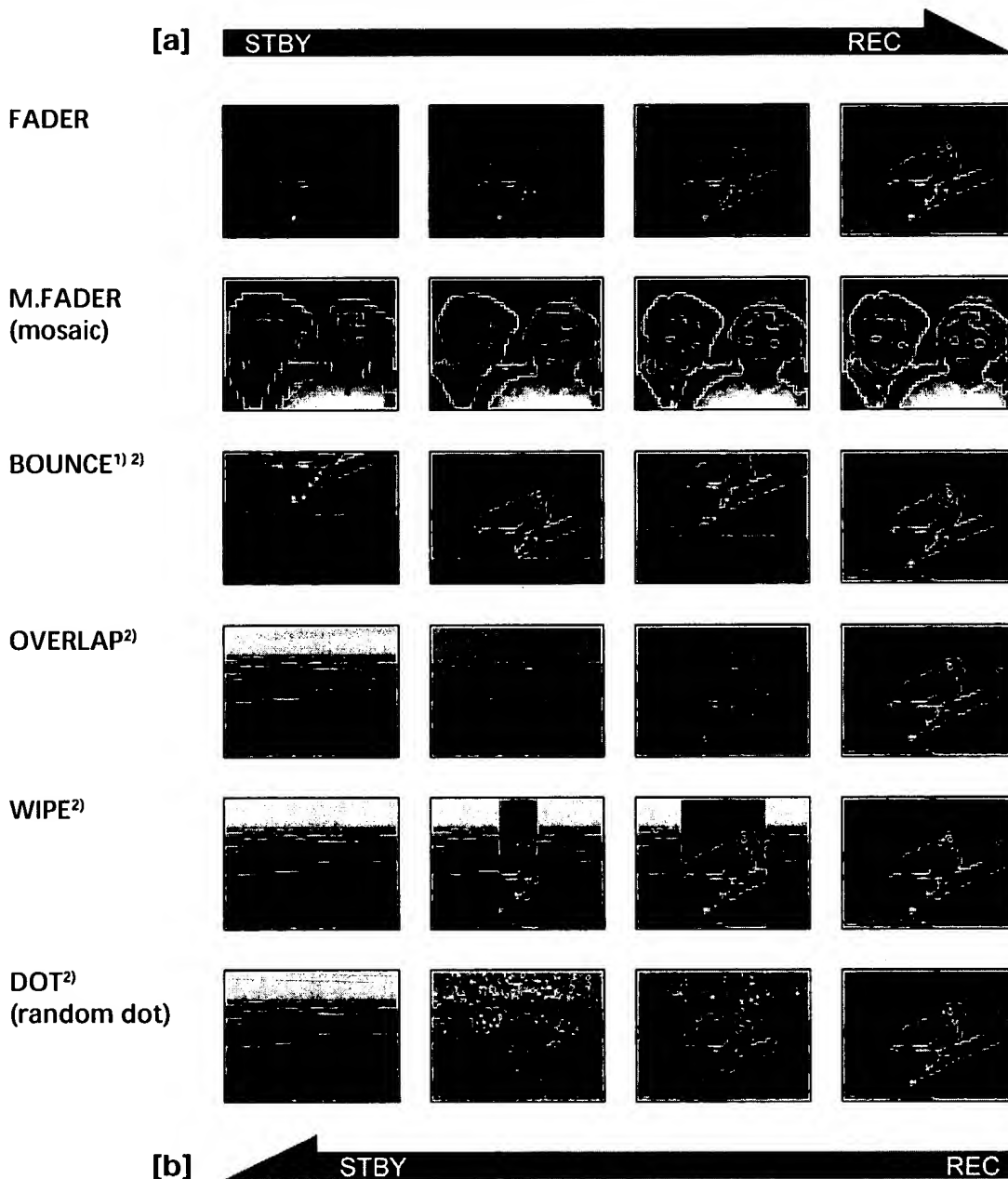
The ID-2 system sends a copyright protection signal with ID-1 signals inserted between video signals when you connect your camcorder to other equipment by an A/V connecting cable.

If the wide mode is set to ON

The SteadyShot function does not work. If you set 16:9WIDE to ON in the menu settings when the SteadyShot function is working, the SteadyShot icon flashes and the SteadyShot function does not function.

Using the fader function

You can fade the picture in or out to give your recording a professional appearance.



MONOTONE

When fading in, the picture gradually changes from black-and-white to color.
When fading out the picture gradually changes from color to black-and-white.

¹⁾ You can use this function when D ZOOM is set to OFF in the menu setting.

²⁾ Fade in only

Using the fader function

(1) When fading in [a]

In the standby mode, press FADER until the desired fader indicator flashes.

When fading out [b]

In the recording mode, press FADER until the desired fader indicator flashes.

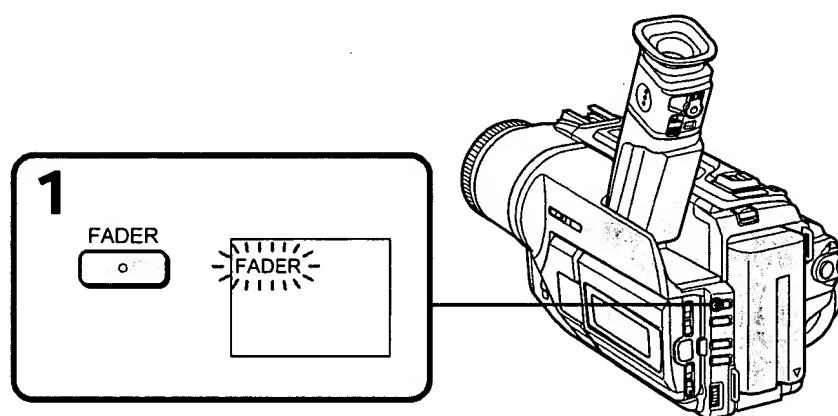
The indicator changes as follows:

FADER → M.FADER → BOUNCE → MONOTONE → OVERLAP →
WIPE → DOT

The last selected fader mode is indicated first of all.

(2) Press START/STOP. The fader indicator stops flashing.

After the fade in/out is carried out, your camcorder automatically returns to the normal mode.



To cancel the fader function

Before pressing START/STOP, press FADER until the indicator disappears.

Using the Fader function

Notes

- The overlap, wipe and dot functions work only for tapes recorded in the Digital8 **D** system.
- You cannot use the following functions while using the fader function. Also, you cannot use the fader function while using the following functions:
 - Digital effect
 - Low lux mode of PROGRAM AE (Overlap, wipe, or dot function only)
 - Super NightShot
 - Tape photo recording

Before operating the overlap, wipe, or dot function

Your camcorder stores the image on the tape. As the image is being stored, the indicator flashes quickly, and the image you are shooting disappears from the LCD or viewfinder screen. Depending on the tape condition, the image may not be recorded clearly.

While using the bounce function, you cannot use the following functions:

- Focus
- Zoom
- Picture effect

Note on the bounce function

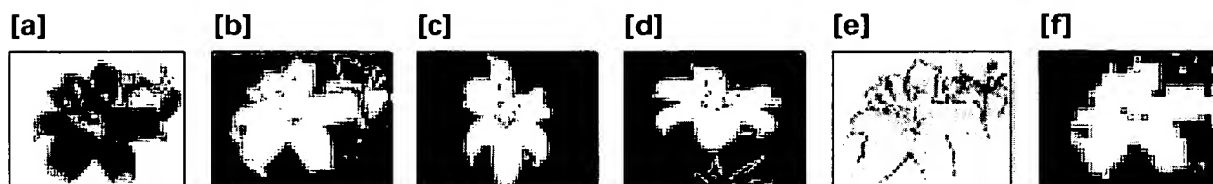
The BOUNCE indicator does not appear in the following mode or functions:

- D ZOOM is activated in the menu settings
- Wide mode
- Picture effect
- PROGRAM AE

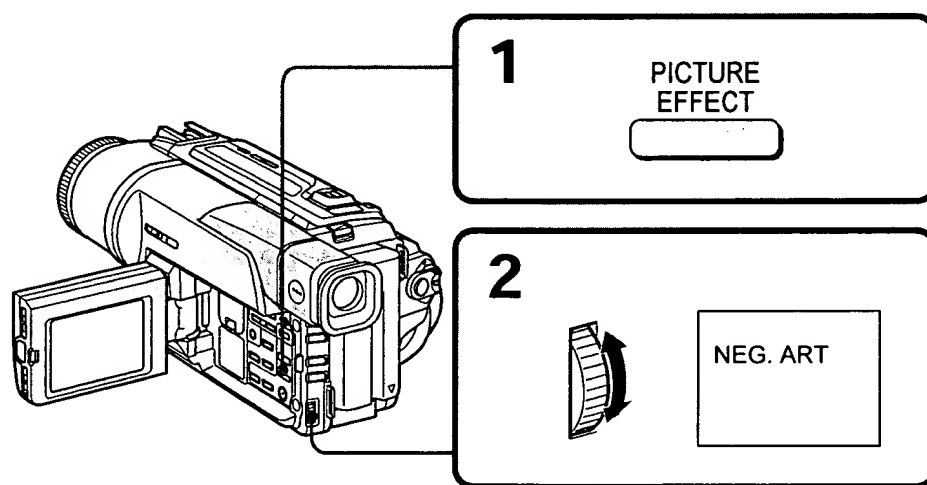
Using special effects – Picture effect

You can digitally process images to obtain special effects like those in films or on the TV.

- NEG. ART [a]** : The color and brightness of the image is reversed.
SEPIA : The image is sepia.
B&W : The image is monochrome (black-and-white).
SOLARIZE [b] : The light intensity is clearer, and the image looks like an illustration.
SLIM [c] : The image expands vertically.
STRETCH [d] : The image expands horizontally.
PASTEL [e] : The contrast of the image is emphasized, and the image looks like an animated cartoon.
MOSAIC [f] : The image is mosaic.



- (1) Press **PICTURE EFFECT** in **CAMERA** mode.
The picture effect indicator appears.
- (2) Turn the **SEL/PUSH EXEC** dial to select the desired picture effect mode.
The indicator changes as follows:
NEG. ART ↔ SEPIA ↔ B&W ↔ SOLARIZE ↔ SLIM ↔ STRETCH ↔ PASTEL ↔ MOSAIC



To turn the picture effect function off

Press **PICTURE EFFECT**.

While using the picture effect function

You cannot select **OLD MOVIE** with **DIGITAL EFFECT**.

When you turn the power off

The picture effect is automatically canceled.

Using special effects – Digital effect

You can add special effects to recorded images using the various digital functions. The sound is recorded normally.

STILL

You can record a still images so that it is superimposed on a moving image.

FLASH (FLASH MOTION)

You can record still images successively at constant intervals.

LUMI. (LUMINANCEKEY)

You can swap a brighter area in a still image with a moving image.

TRAIL

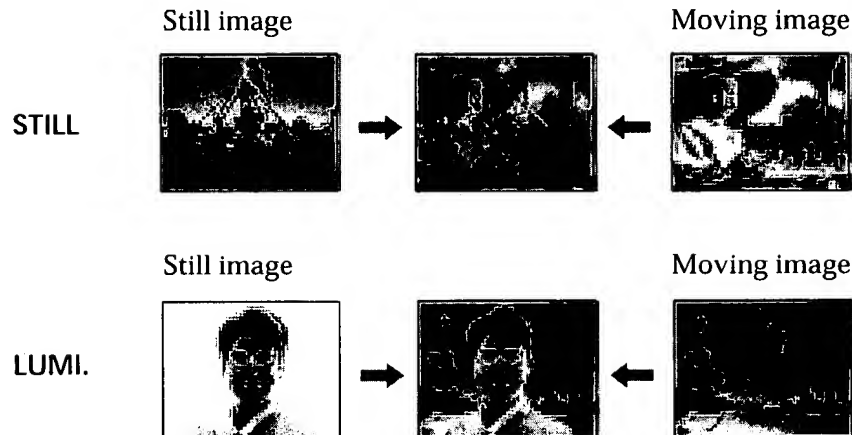
You can record the image so that an incidental image like a trail is left.

SLOW SHTR (SLOW SHUTTER)

You can slow down the shutter speed. The slow shutter mode is good for recording dark images more brightly. However, the image may be less clear.

OLD MOVIE

You can add an old movie type atmosphere to images. Your camcorder automatically sets the wide mode to ON, picture effect to SEPIA, and the appropriate shutter speed.



Using special effects – Digital effect

- (1) Press DIGITAL EFFECT in CAMERA mode. The digital effect indicator appears.
- (2) Turn the SEL/PUSH EXEC dial to select the desired digital effect mode. The indicator changes as follows:
STILL ↔ FLASH ↔ LUMI. ↔ TRAIL ↔ SLOW SHTR ↔ OLD MOVIE
- (3) Press the SEL/PUSH EXEC dial. The indicator lights up and the bars appear. In the STILL and LUMI. modes, the still image is stored in memory.
- (4) Turn the SEL/PUSH EXEC dial to adjust the effect as follows:

STILL – The rate of the still image you want to superimpose on the moving image

FLASH – The interval of flash motion

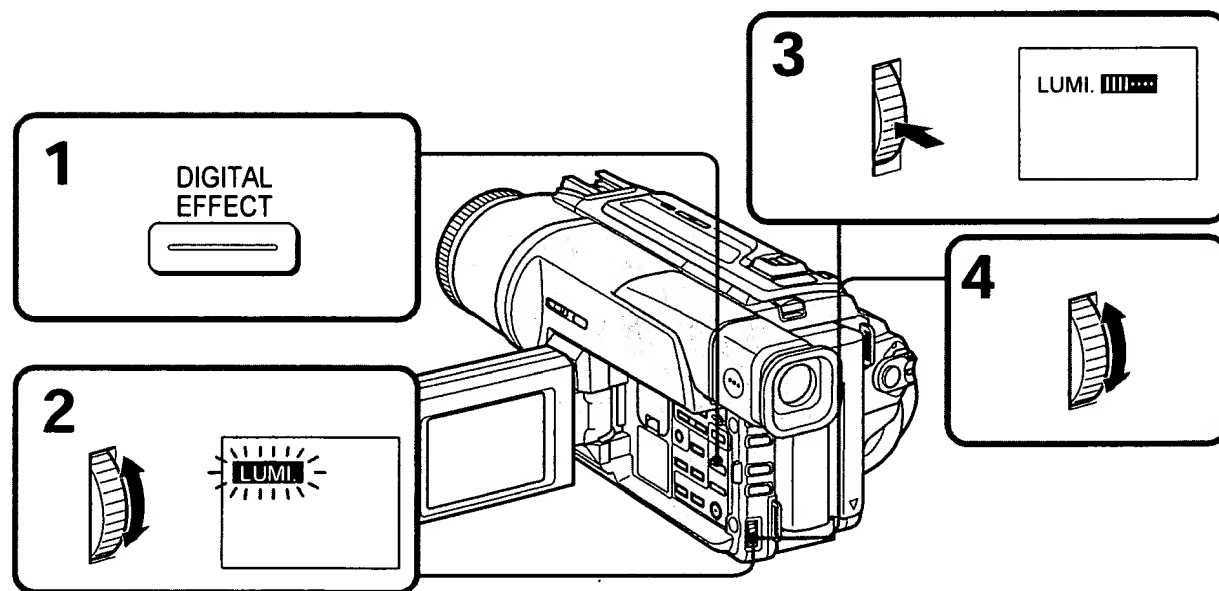
LUMI. – The color scheme of the area in the still image which is to be swapped with a moving image

TRAIL – The vanishing time of the incidental image

SLOW SHTR – Shutter speed. The larger the shutter speed number, the slower the shutter speed.

OLD MOVIE – No adjustment necessary

The more bars there are on screen, the stronger the digital effect. The bars appear in the following modes: STILL, FLASH, LUMI. and TRAIL.



To cancel the digital effect
Press DIGITAL EFFECT.

Using special effects – Digital Effect

Notes

- The following functions do not work during digital effect:
 - Fader
 - Low lux mode of PROGRAM AE
 - Tape photo recording
 - Super NightShot
- The following functions do not work in the slow shutter mode:
 - Exposure
 - PROGRAM AE
- The following functions do not work in the old movie mode:
 - Exposure
 - Wide mode
 - Picture effect
 - PROGRAM AE

When you turn the power off

The digital effect is automatically canceled.

When recording in the slow shutter mode

Auto focus may not be effective. Focus manually using a tripod.

Shutter speed

Shutter speed number	Shutter speed
SLOW SHTR 1	1/30
SLOW SHTR 2	1/15
SLOW SHTR 3	1/8
SLOW SHTR 4	1/4

Using the PROGRAM AE function

You can select PROGRAM AE (Auto Exposure) mode to suit your specific shooting requirements.

Spotlight mode

This mode prevents people's faces, for example, from appearing excessively white when shooting subjects lit by strong light in the theater.

Soft portrait mode

This mode brings out the subject while creating a soft background for subjects such as people or flowers.

Sports lesson mode

This mode minimizes shake on fast-moving subjects such as in tennis or golf.

Beach & ski mode

This mode prevents people's faces from appearing dark in strong light or reflected light, such as at a beach in midsummer or on a ski slope.

Sunset & moon mode

This mode allows you to maintain atmosphere when you are recording sunsets, general night views, fireworks displays and neon signs.

Landscape mode

This mode is for when you are recording distant subjects such as mountains and prevents your camcorder from focusing on glass or metal mesh in windows when you are recording a subject behind glass or a screen.

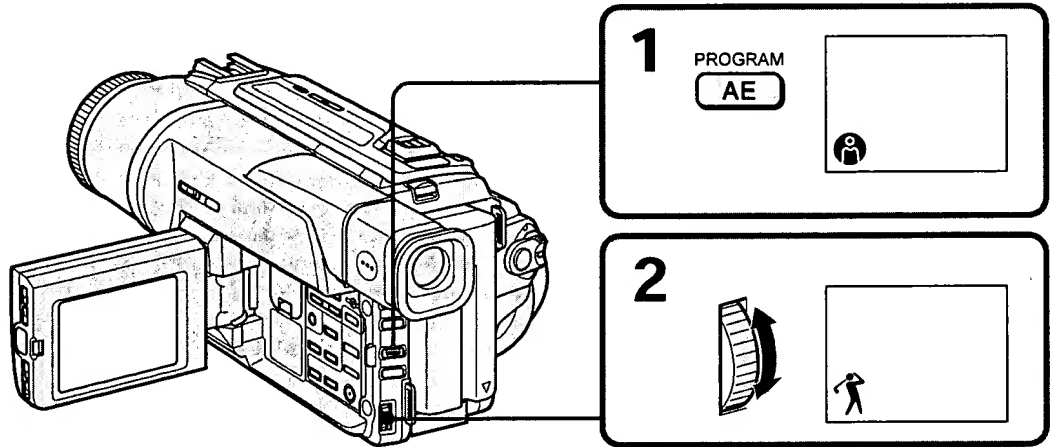
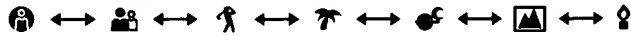
Low lux mode

This mode makes subjects brighter in insufficient light.



Using the PROGRAM AE function

- (1) Press PROGRAM AE in CAMERA or MEMORY (DCR-TRV320 only) mode.
The PROGRAM AE indicator appears.
- (2) Turn the SEL/PUSH EXEC dial to select the desired mode.
The indicator changes as follows:



To turn the PROGRAM AE function off

Press PROGRAM AE.

Notes

- In the spotlight, sports lesson and beach & ski modes, you cannot take close-ups. This is because your camcorder is set to focus only on subjects in the middle to far distance.
- In the sunset & moon and landscape modes, your camcorder is set to focus only on distant subjects.
- The following functions do not work in the PROGRAM AE mode:
 - Slow shutter
 - Old movie
 - Bounce
- The following functions do not work in the low lux mode:
 - Digital effect
 - Overlap
 - Wipe
 - Dot
 - Exposure
- While setting the NIGHTSHOT to ON, the PROGRAM AE function does not work. (The indicator flashes.)
- While shooting in MEMORY mode, the low lux mode does not work. (The indicator flashes.) (DCR-TRV320 only)

If you are recording under a discharge tube such as a fluorescent lamp, sodium lamp or mercury lamp

Flickering or changes in color may occur in the following modes. If this happens, turn the PROGRAM AE function off.

- Soft portrait mode
- Sports lesson mode

Adjusting the exposure manually

You can manually adjust and set the exposure.

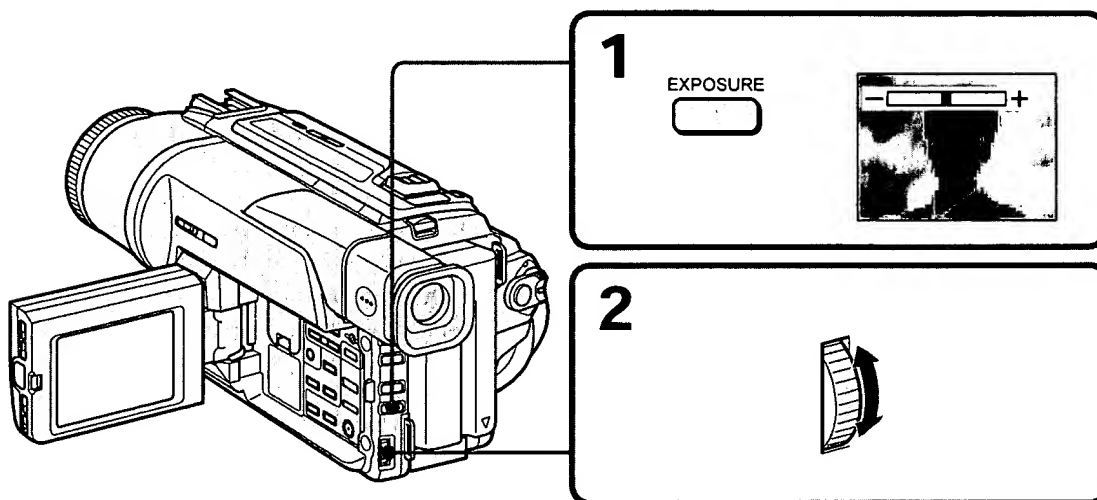
Adjust the exposure manually in the following cases:

- The subject is backlit
- Bright subject and dark background
- To record dark pictures (e.g. night scenes) faithfully

(1) Press EXPOSURE in CAMERA or MEMORY (DCR-TRV320 only) mode.

The exposure indicator appears on the LCD screen or in the viewfinder.

(2) Turn the SEL/PUSH EXEC dial to adjust the brightness.



Advanced Recording Operations

To return to the automatic exposure mode

Press EXPOSURE.

Notes

- When you adjust the exposure manually, the following function and modes do not work in CAMERA mode:
 - Backlight
 - Old movie
 - Slow shutter
- When you adjust the exposure manually, the backlight function does not work in MEMORY mode. (DCR-TRV320 only)

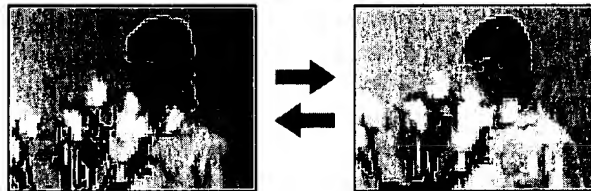
Your camcorder automatically returns to the automatic mode:


- if you change the PROGRAM AE mode
- if you slide NIGHTSHOT to ON

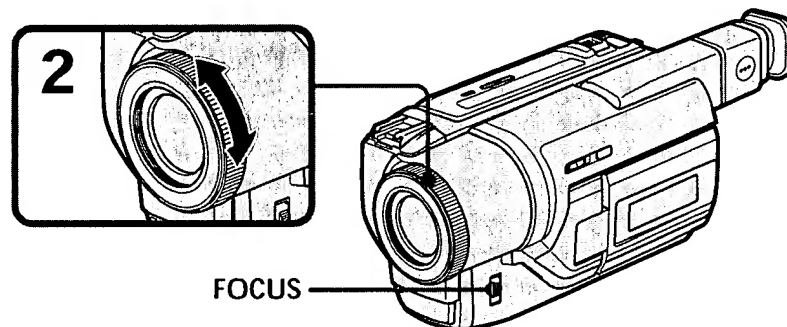
Focusing manually

You can gain better results by manually adjusting the focus in the following cases:

- The autofocus mode is not effective when shooting:
 - subjects through glass coated with water droplets.
 - horizontal stripes.
 - subjects with little contrast with backgrounds such as walls and sky.
- When you want to change the focus from a subject in the foreground to a subject in the background.
- Shooting a stationary subject when using a tripod.




- (1) Set FOCUS to MANUAL in CAMERA or MEMORY (DCR-TRV320 only) mode. The  indicator appears on the LCD screen or in the viewfinder.
- (2) Turn the focus ring to sharpen focus.



To return to the autofocus mode

Set FOCUS to AUTO.

To record distant subjects

When you press FOCUS down to INFINITY. The lens focuses on infinity and  indicator appears. When you release FOCUS, your camcorder returns to the manual focus mode. Use this mode when your camcorder focuses on near objects even though you are trying to shoot a distant object.



To focus precisely

Adjust the zoom by first focusing at the "T" (telephoto) position and then shooting at the "W" (wide-angle) position. This makes focusing easier.

When you shoot close to the subject

Focus at the end of the "W" (wide-angle) position.


 changes to the following indicators:

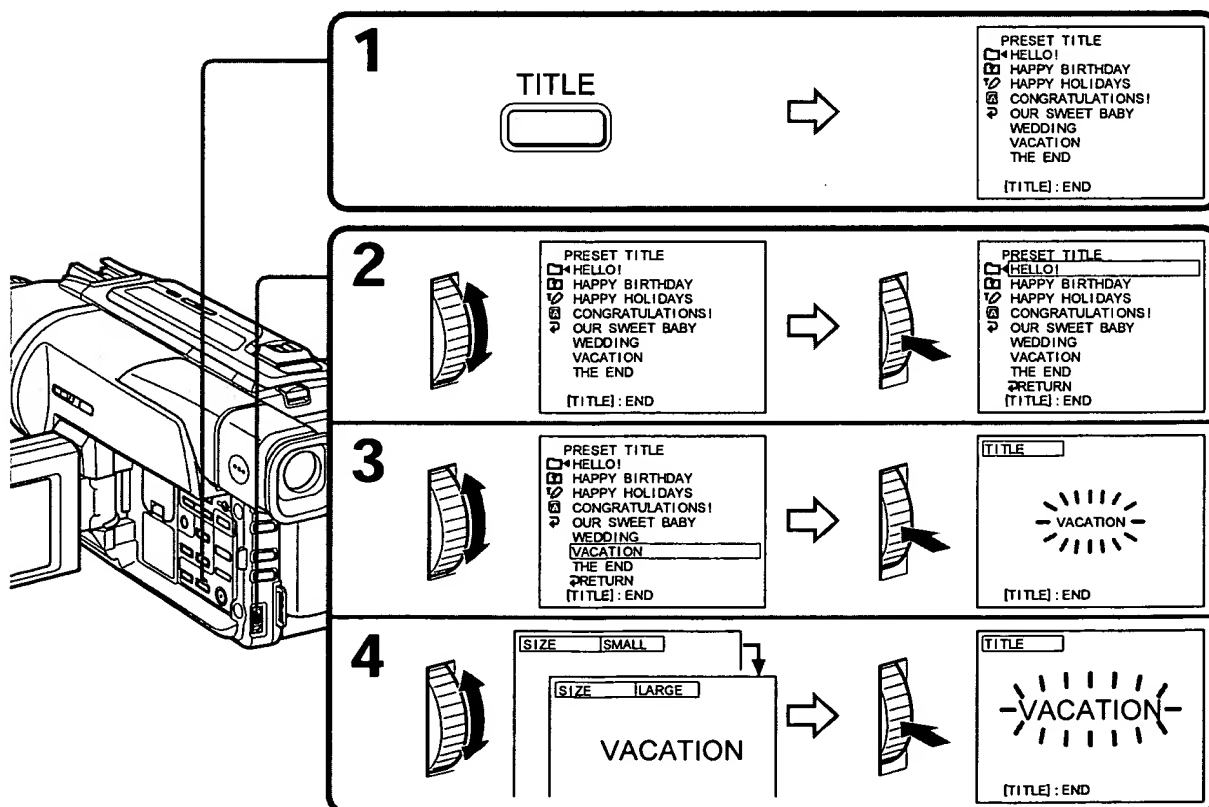
-  when recording a distant subject.
-  when the subject is too close to focus on.

Superimposing a title

You can select one of eight preset titles and two custom titles (p. 45). You can also select the language, color, size and position of titles.



- (1) Press TITLE to display the title menu in the standby mode.
- (2) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (3) Turn the SEL/PUSH EXEC dial to select the desired title, then press the dial.
The titles are displayed in the language you selected.
- (4) Change the color, size, or position, if necessary.
 - ① Turn the SEL/PUSH EXEC dial to select the color, size, or position, then press the dial. The item appears.
 - ② Turn the SEL/PUSH EXEC dial to select the desired item, then press the dial.
 - ③ Repeat steps ① and ② until the title is laid out as desired.
- (5) Press the SEL/PUSH EXEC dial again to complete the setting.
- (6) Press START/STOP to start recording.
- (7) When you want to stop recording the title, press TITLE.




Superimposing a title

To superimpose the title while you are recording

Press TITLE while you are recording, and carry out steps 2 to 5. When you press the SEL/PUSH EXEC dial at step 5, the title is recorded.

To select the language of a preset title

If you want to change the language, select  before step 2. Then select the desired language and return to step 2.

If you display the menu while superimposing a title

The title is not recorded while the menu is displayed.

To use the custom title

If you want to use the custom title, select  in step 2.

If you have not made any custom title, " - - - - ..." appears on the display.

Title setting

- The title color changes as follows :
WHITE ↔ YELLOW ↔ VIOLET ↔ RED ↔ CYAN ↔ GREEN ↔ BLUE
- The title size changes as follows :
SMALL ↔ LARGE
You cannot input more than 12 characters in LARGE size.
- The title position changes as follows :
1 ↔ 2 ↔ 3 ↔ 4 ↔ 5 ↔ 6 ↔ 7 ↔ 8 ↔ 9
The larger the position number, the lower the title is positioned.
When you select the title size LARGE, you cannot choose position 9.

When you are selecting and setting the title

You cannot record the title displayed on the screen.

When you superimpose a title while you are recording

The beep does not sound.


While you are playing back

You can superimpose a title. However, the title is not recorded on tape.

You can record a title when you dub a tape connecting your camcorder to the VCR with the A/V connecting cable. If you use the i. LINK cable instead of the A/V connecting cable, you cannot record the title.

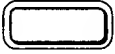
Making your own titles

You can make up to two titles and store them in your camcorder. Each title can have up to 20 characters.


- (1) Press TITLE in the standby or VTR mode.
- (2) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (3) Turn the SEL/PUSH EXEC dial to select the first line (CUSTOM1) or second line (CUSTOM2), then press the dial.
- (4) Turn the SEL/PUSH EXEC dial to select the column of the desired character, then press the dial.
- (5) Turn the SEL/PUSH EXEC dial to select the desired character, then press the dial.
- (6) Repeat steps 4 and 5 until you have selected all characters and completed the title.
- (7) To finish making your own titles, turn the SEL/PUSH EXEC dial to select [SET], then press the dial. The title is stored in memory.
- (8) Press TITLE to make the title menu disappear.


1


TITLE





PRESET TITLE


 HELLO!


 HAPPY BIRTHDAY


 HAPPY HOLIDAYS

 CONGRATULATIONS!

 OUR SWEET BABY


 WEDDING

 VACATION

 THE END

[TITLE]: END

2




TITLE SET

CUSTOM1

CUSTOM2

[TITLE]: END




TITLE SET

RETURN

[TITLE]: END


3



TITLE SET

RETURN

[TITLE]: END



TITLE SET P1

ABCDE 12345 \$FVDM

FGHIJ 67890 010*

KLMNO AEIOU [+]

PQRST AEIOU [+P2]

UVWXY AEIOU [SET]


ZA ?! AONB

.../- ATOQA

[TITLE]: END

4

1



TITLE SET P1

ABCDE 12345 \$FVDM

FGHIJ 67890 010*

KLMNO AEIOU [+]

PQRST AEIOU [+P2]


UVWXY AEIOU [SET]

ZA ?! AONB

.../- ATOQA

[TITLE]: END

2



TITLE SET P1

ABCDE 12345 \$FVDM

FGHIJ 67890 010*

KLMNO AEIOU [+]

PQRST AEIOU [+P2]


UVWXY AEIOU [SET]

ZA ?! AONB

.../- ATOQA

[TITLE]: END

3



TITLE SET P1

ABCDE 12345 \$FVDM

FGHIJ 67890 010*

KLMNO AEIOU [+]

PQRST AEIOU [+P2]


UVWXY AEIOU [SET]

ZA ?! AONB

.../- ATOQA

[TITLE]: END

4



TITLE SET P1

S

ABCDE 12345 \$FVDM

FGHIJ 67890 010*

KLMNO AEIOU [+]

PQRST AEIOU [+P2]

UVWXY AEIOU [SET]

ZA ?! AONB

.../- ATOQA

[TITLE]: END

45

Making your own titles

To change a title you have stored

In step 3, select CUSTOM1 or CUSTOM2, depending on which title you want to change, then press the SEL/PUSH EXEC dial. Turn the SEL/PUSH EXEC dial to select [←], then press the dial to delete the title. The last character is erased. Enter the new title as desired.

If you take 3 minutes or longer to enter characters in the standby mode while a cassette is in your camcorder

The power automatically goes off. The characters you have entered remain stored in memory. Set the POWER switch to OFF (CHARGE) once, and turn it to CAMERA again, then proceed from step 1.

We recommend setting the POWER switch to VTR or removing the cassette so that your camcorder does not automatically turn off while you are entering title characters.

If you select [→P2]

The menu for selecting alphabet and Russian characters appear. Select [→P1] to return to the previous screen.

To erase a character

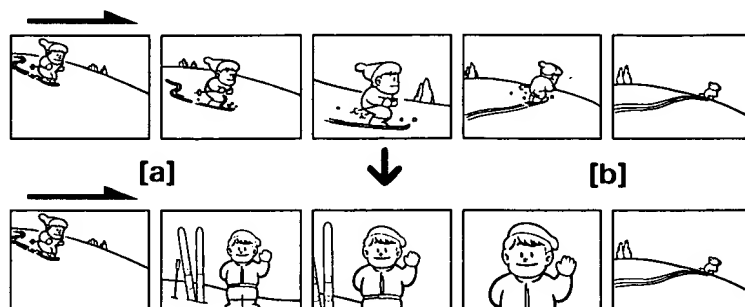
Select [←]. The last character is erased.

To enter a space

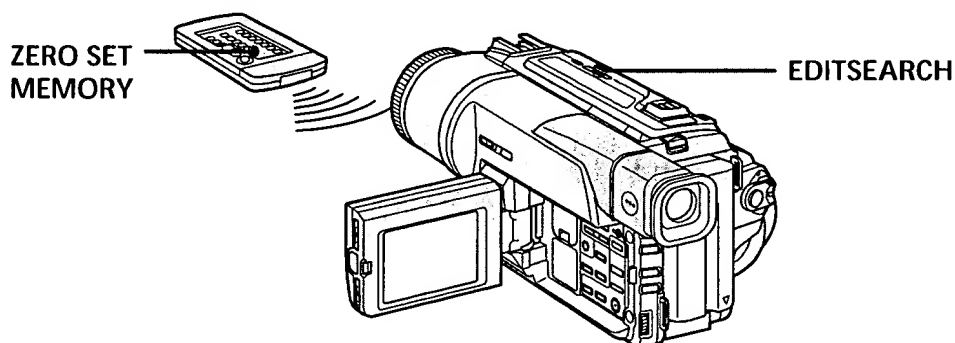
Select [Z& ?!] , then select the blank part.

Inserting a scene

You can insert a scene in the middle of a recorded tape by setting the start and end points. The previously recorded frames between these start and end points will be erased. Use the Remote Commander for this operation.



- (1) While your camcorder is in the standby mode, keep pressing EDITSEARCH, and release the button at the insert end point [b].
- (2) Press ZERO SET MEMORY. The ZERO SET MEMORY indicator flashes and the counter resets to zero.
- (3) Keep pressing the - [EDITSEARCH] side of EDITSEARCH and release the button at the insert start point [a].
- (4) Press START/STOP to start recording. The scene is inserted. Recording stops automatically near the counter zero point. Your camcorder returns to the standby mode.



Notes

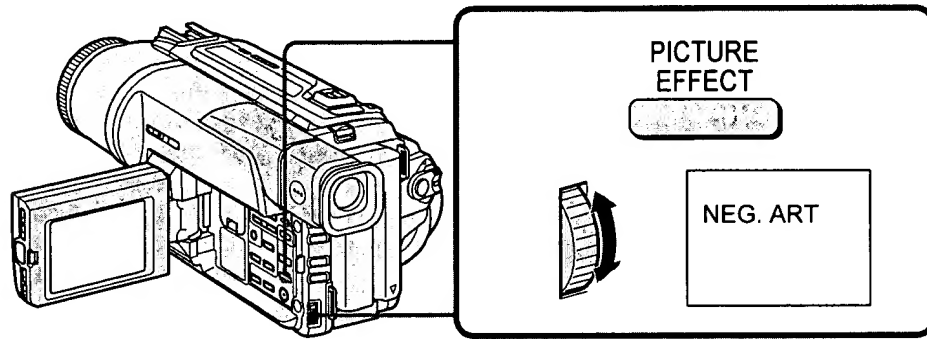
- The zero set memory function works only for tapes recorded in the Digital8 **D** system.
- The picture and the sound may be distorted at the end of the inserted section when it is played back.

If a tape has a blank portion in the recorded portions
The zero set memory function may not work correctly.

Playing back a tape with picture effects

During playback, you can process a scene using the picture effect functions: NEG.ART, SEPIA, B&W and SOLARIZE.

During playback, press PICTURE EFFECT and turn the SEL/PUSH EXEC dial until the desired picture effect indicator (NEG.ART, SEPIA, B&W or SOLARIZE) appears. For details of each picture effect function, see page 35.



To cancel the picture effect function

Press PICTURE EFFECT.

Notes

- The picture effect function works only for tapes recorded in the Digital8 **D** system.
- You cannot process externally input scenes using the picture effect function.
- You cannot record pictures that you have processed using the picture effect function with this camcorder. To record pictures that you have processed using the picture effect function, record the pictures on the VCR using your camcorder as a player.

Pictures processed by the picture effect function

Pictures processed by the picture effect function are not output through the **i** DV IN/OUT jack.

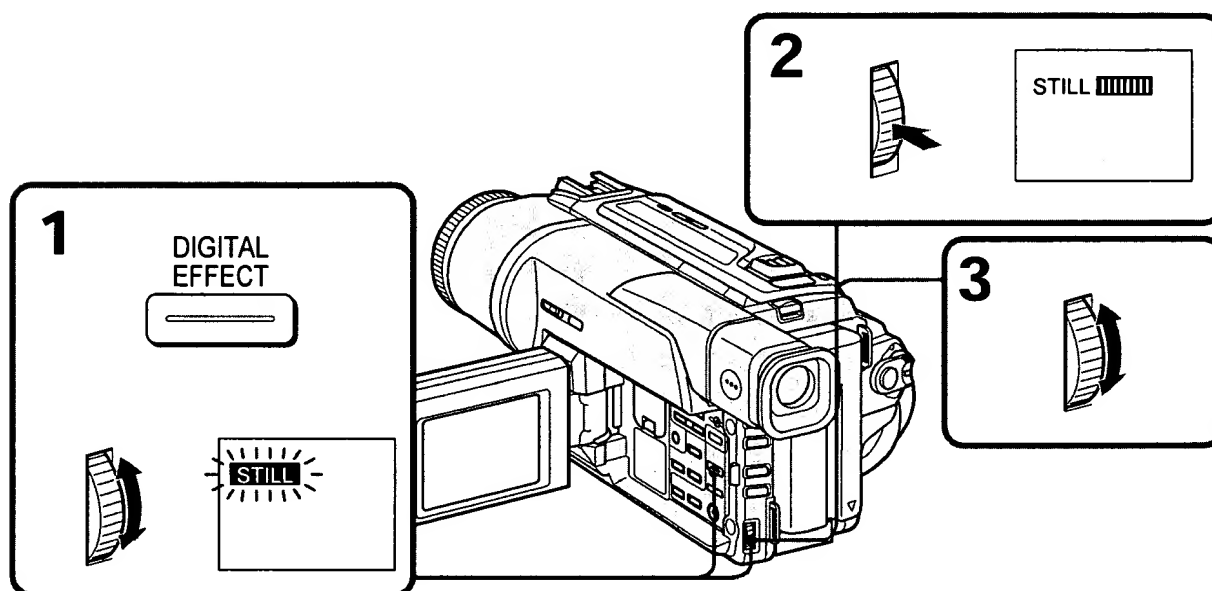
When you set the POWER switch to OFF (CHARGE) or stop playing back

The picture effect function is automatically canceled.

Playing back a tape with digital effects

During playback, you can process a scene using the digital effect functions: STILL, FLASH, LUMI. and TRAIL.

- (1) During playback, press DIGITAL EFFECT and turn the SEL/PUSH EXEC dial until the desired digital effect indicator (STILL, FLASH, LUMI. or TRAIL) flashes.
- (2) Press the SEL/PUSH EXEC dial.
The digital effect indicator lights up and the bars appear. In the STILL or LUMI. mode, the image where you press the SEL/PUSH EXEC dial is stored in memory as a still image.
- (3) Turn the SEL/PUSH EXEC dial to adjust the effect.
For details of each digital effect function, see page 36.



Advanced Playback Operations

To cancel the digital effect function

Press DIGITAL EFFECT.

Notes

- The digital effect function works only for tapes recorded in the Digital8 **D** system.
- You cannot process externally input scenes using the digital effect function.
- You cannot record images that you have processed using the digital effect function with this camcorder. To record images that you have processed using the digital effect function, record the images on the VCR using your camcorder as a player.

Pictures processed by the digital effect function

Pictures processed by the digital effect function are not output through the **i** DV IN/OUT jack.

When you set the POWER switch to OFF (CHARGE) or stop playing back
The digital effect function is automatically canceled.

Enlarging recorded images – PB ZOOM

You can enlarge moving and still images recorded on tapes.

Besides the operation described here, your camcorder can enlarge still images recorded on "Memory Stick"s (DCR-TRV320 only).

(1) Press PB ZOOM on your camcorder while you are playing back. The image is enlarged, and $\uparrow\downarrow$ appears on the LCD screen or in the viewfinder.

(2) Turn SEL/PUSH EXEC dial to move the enlarged image, then press the dial.

\uparrow : The image moves downwards

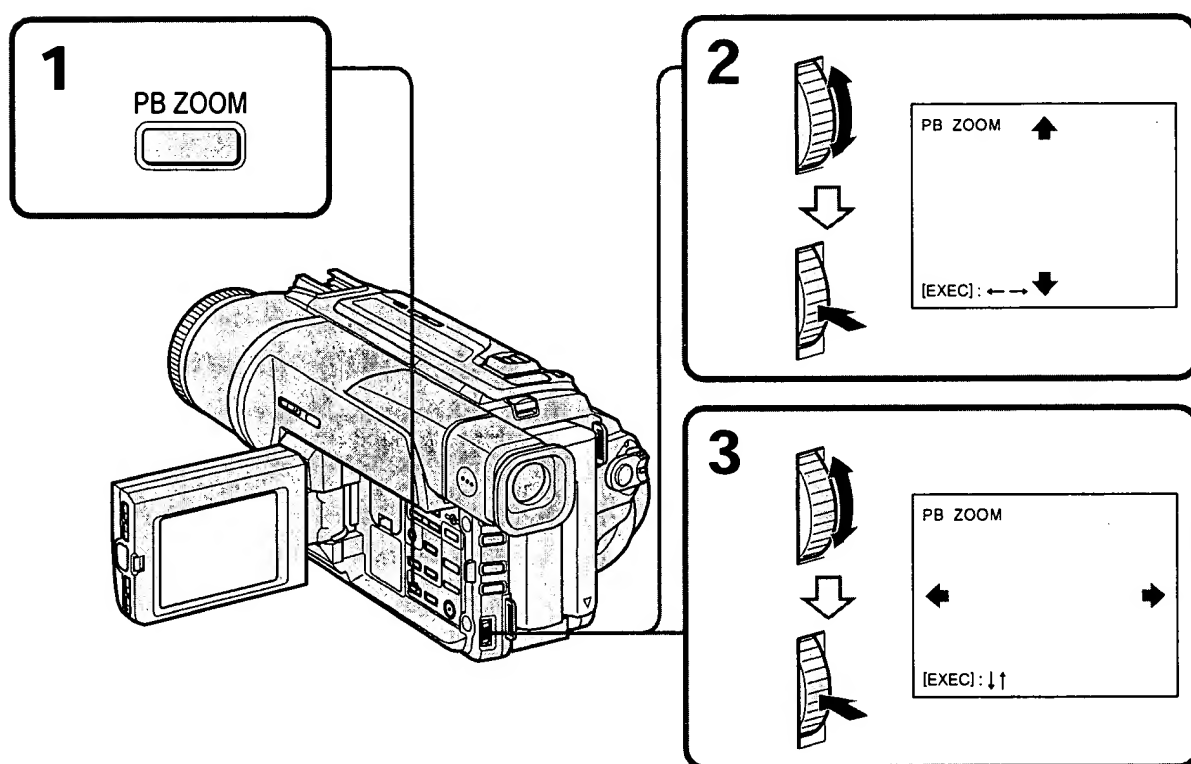
\downarrow : The image moves upwards

$\leftarrow\rightarrow$ becomes available.

(3) Turn SEL/PUSH EXEC dial to move the enlarged image, then press the dial.

\leftarrow : The image moves rightward (Turn the dial downwards.)

\rightarrow : The image moves leftward (Turn the dial upwards.)



To cancel PB ZOOM function

Press PB ZOOM.

Notes

- PB ZOOM works only for tapes recorded in the Digital8 **D** system.
- You cannot process externally input scenes using PB ZOOM function.
- You cannot record pictures that you have processed using PB ZOOM function with this camcorder. To record pictures that you have processed using PB ZOOM function, record the pictures on the VCR using your camcorder as a player.

Pictures processed by PB ZOOM function

Pictures processed by PB ZOOM function are not output through the **i** DV IN/OUT jack.

When you set the POWER switch to OFF (CHARGE) or stop playing back PB ZOOM function is automatically canceled.

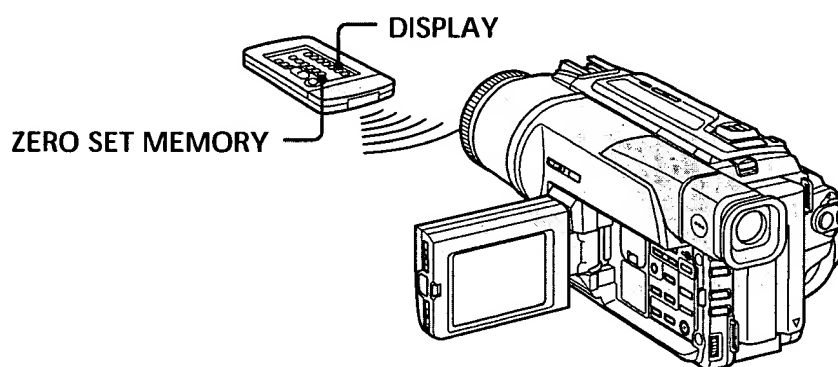
Quickly locating a scene using the zero set memory function

Your camcorder goes forward or backward to automatically stop at a desired scene having a counter value of "0:00:00".

Use the Remote Commander for this operation.

Use this function, for example, to view a desired scene later on during playback.

- (1) In the playback mode, press DISPLAY.
- (2) Press ZERO SET MEMORY at the point you want to locate later. The counter shows "0:00:00" and the ZERO SET MEMORY indicator flashes.
- (3) Press ■ when you want to stop playback.
- (4) Press ◀◀ to rewind the tape to the counter's zero point. The tape stops automatically when the counter reaches approximately zero. The ZERO SET MEMORY indicator disappears and the time code appears.
- (5) Press ▶▶. Playback starts from the counter's zero point.



Notes

- The zero set memory function works only for tapes recorded in the Digital8 **D** system.
- When you press ZERO SET MEMORY before rewinding the tape, the zero set memory function is canceled.
- There may be a discrepancy of several seconds from the time code.

If a tape has a blank portion in the recorded portions

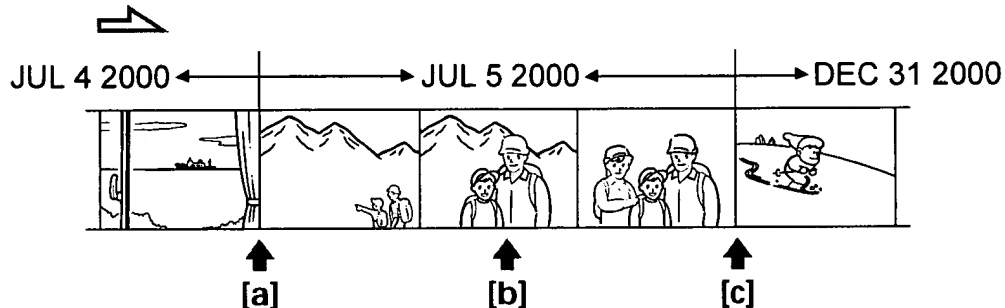
The zero set memory function may not work correctly.

ZERO SET MEMORY functions also in the standby mode

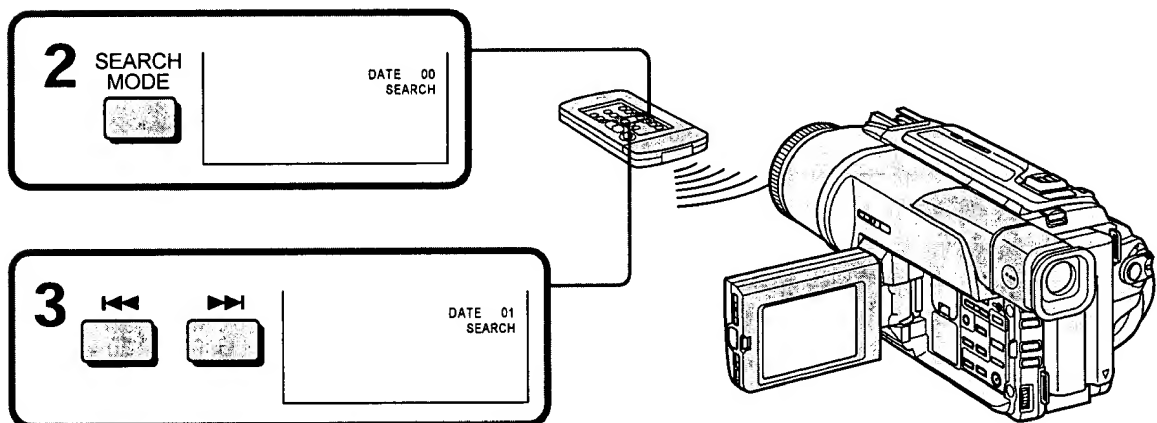
When you insert a scene in the middle of a recorded tape, press ZERO SET MEMORY at the point you want to end the insertion. Rewind the tape to the insert start point, and start recording. Recording stops automatically at the tape counter zero point. Your camcorder returns to the standby mode.

Searching a recording by date - Date search

You can automatically search for the point where the recording date changes and start playback from that point (**Date search**). Use the Remote Commander for this operation. Use this function to check where recording dates change or to edit the tape at each recording date.



- (1) Set the POWER switch to VTR.
- (2) Press SEARCH MODE on the Remote Commander repeatedly, until the date search indicator appears.
The indicator changes as follows:
DATE SEARCH → PHOTO SEARCH → PHOTO SCAN
- (3) When the current position is [b], press ◀◀ to search towards [a] or press ▶▶ to search towards [c]. Your camcorder automatically starts playback at the point where the date changes.
Each time you press ◀◀ or ▶▶, the camcorder searches for the previous or next date.



To stop searching
Press ■.

Searching a recording by date – Date search

Notes

- The date search works only for tapes recorded in the Digital8 **D** system.
- If one day's recording is less than two minutes, your camcorder may not accurately find the point where the recording date changes.

If a tape has a blank portion in the recorded portions

The date search function may not work correctly.

Searching for a photo

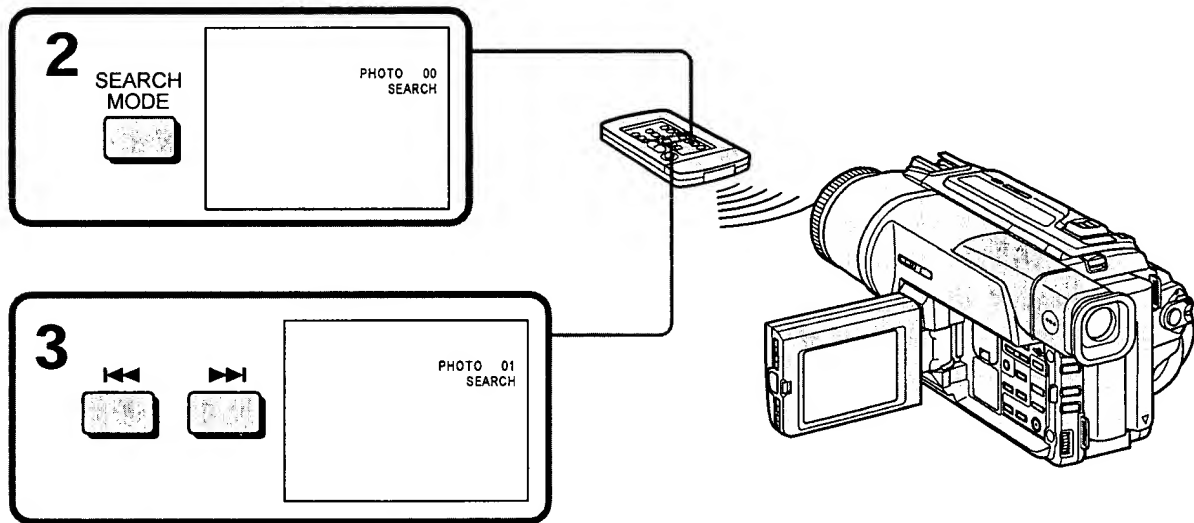
- Photo search/Photo scan

You can search for the still image recorded on tape (**photo search**).

You can also search for still images one after another and display each image for five seconds automatically (**photo scan**). Use the Remote Commander for these operations.

Searching for a photo

- (1) Set the POWER switch to VTR.
- (2) Press SEARCH MODE on the Remote Commander repeatedly, until the photo search indicator appears.
The indicator changes as follows:
DATE SEARCH → PHOTO SEARCH → PHOTO SCAN
- (3) Press ◀◀ or ▶▶ to select the photo for playback. Each time you press ◀◀ or ▶▶, the camcorder searches for the previous or next photo. Your camcorder automatically starts playback from the photo.



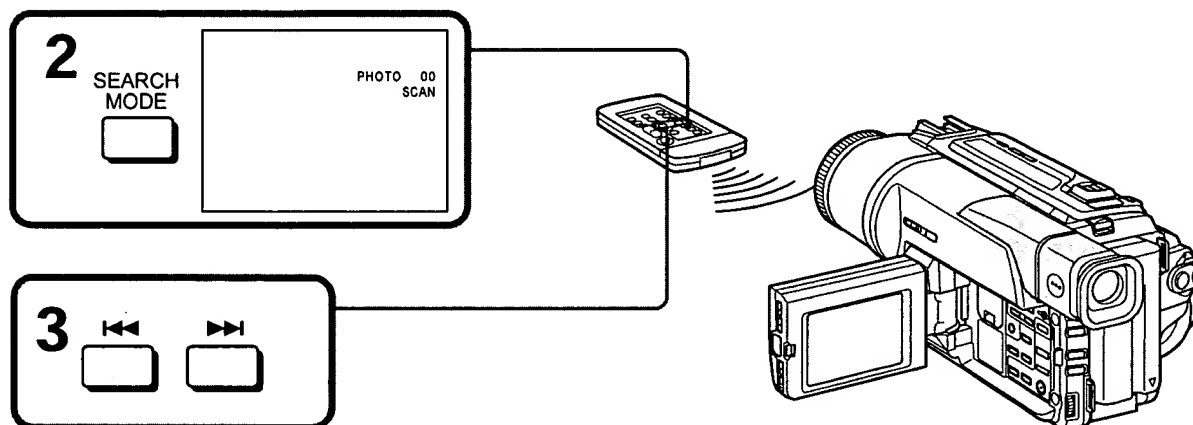
To stop searching

Press ■.

Searching for a photo – Photo search/Photo scan

Scanning photo

- (1) Set the POWER switch to VTR.
 - (2) Press SEARCH MODE on the Remote Commander repeatedly, until the photo scan indicator appears.
The indicator changes as follows:
DATE SEARCH → PHOTO SEARCH → PHOTO SCAN
 - (3) Press ◀◀ or ▶▶.
- Each photo is played back for about 5 seconds automatically.



Advanced Playback Operations

To stop scanning

Press ■.

Note

The photo search and photo scan work only for tapes recorded in the Digital8 **D** system.

If a tape has a blank portion in the recorded portions

The photo search and photo scan functions may not work correctly.

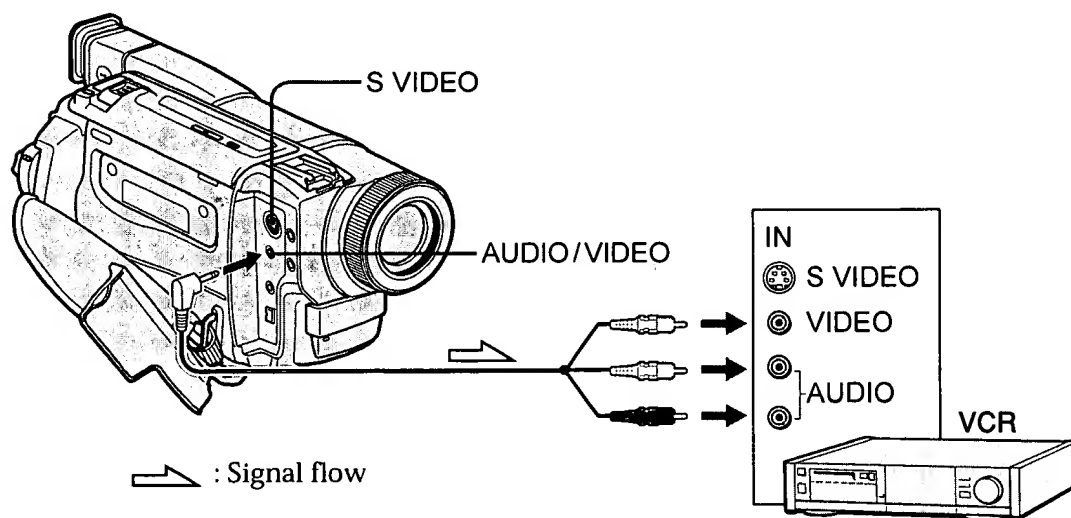
Dubbing a tape

Using the A/V connecting cable

Connect your camcorder to the VCR using the A/V connecting cable supplied with your camcorder.

- (1) Insert a blank tape (or a tape you want to record over) into the VCR, and insert the recorded tape into your camcorder.
- (2) Set the input selector on the VCR to LINE. Refer to the operating instructions of your VCR for more information.
- (3) Set the POWER switch to VTR.
- (4) Play back the recorded tape on your camcorder.
- (5) Start recording on the VCR.

Refer to the operating instructions of your VCR for more information.



When you have finished dubbing a tape

Press **■** on both your camcorder and the VCR.

Be sure to clear the indicators from the screen

If they are displayed, press the following buttons not to record the indicators on the dubbed tape:

- DISPLAY
- DATA CODE
- SEARCH MODE on the Remote Commander

You can edit on VCRs that support the following systems:

8 8 mm, **Hi8** Hi8, **VHS** VHS, **S-VHS** S-VHS, **VHSC** VHSC, **S-VHSC** S-VHSC, **β** Betamax, **Mini DV** mini DV, **DV** DV or **D** Digital8

If your VCR is a monaural type

Connect the yellow plug of the A/V connecting cable to the video input jack and the white or the red plug to the audio input jack on the VCR or the TV. When the white plug is connected, the left channel audio is output, and the red plug is connected, the right channel audio is output.


If your VCR has an S video jack

Connect using an S video cable (not supplied) to obtain high-quality pictures. With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.

Connect an S video cable (not supplied) to the S video jacks of both your camcorder and the VCR.

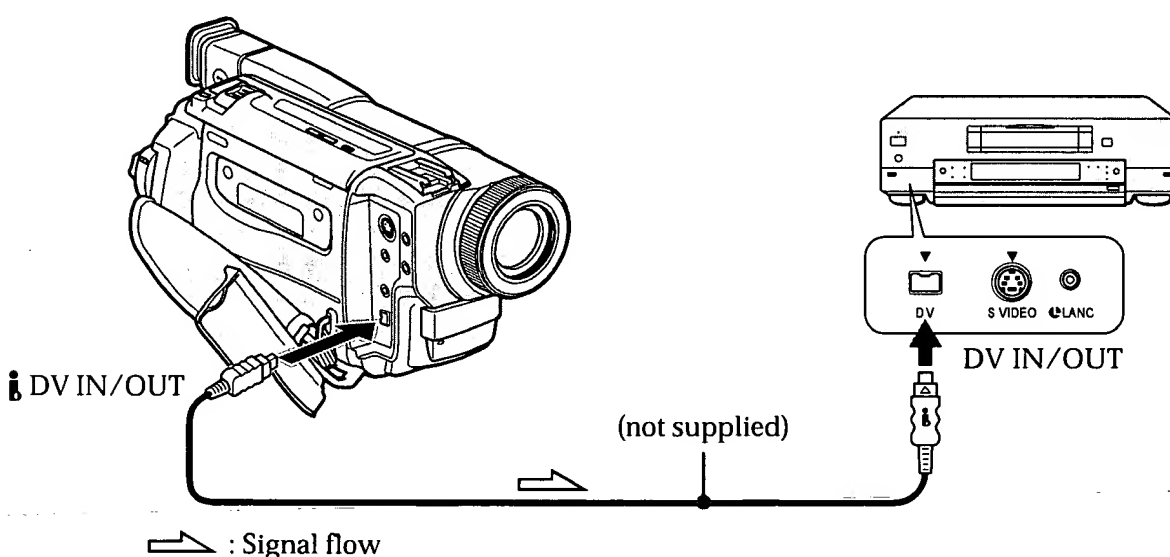
Dubbing a tape

Using the i.LINK cable (DV connecting cable)

Simply connect the i.LINK cable (DV connecting cable) (not supplied) to  DV IN/OUT and to DV IN/OUT of the DV products. With digital-to-digital connection, video and audio signals are transmitted in digital form for high-quality editing. You cannot dub the screen indicators.


- (1) Insert a blank tape (or a tape you want to record over) into the VCR, and insert the recorded tape into your camcorder.
- (2) Set the input selector on the VCR to DV IN if it is available. Refer to the operating instructions of your VCR for more information.
- (3) Set the POWER switch to VTR.
- (4) Play back the recorded tape on your camcorder.
- (5) Start recording on the VCR.

Refer to the operating instructions of your VCR for more information.



Editing


When you have finished dubbing a tape

Press  on both your camcorder and the VCR.

Note on tapes that are not recorded in the Digital8 system

The picture may fluctuate. This is not a malfunction.

During playback of tapes recorded in the Hi8/standard 8 system

Digital signals are output as the image signals from the  DV IN/OUT jack.

You can connect one VCR only using the i.LINK cable (DV connecting cable).
See page 103 for details about i.LINK.

During digital editing

You cannot use PICTURE EFFECT or DIGITAL EFFECT button function.

If you record playback pause picture via the DV IN/OUT jack

The recorded picture becomes rough. Also, when you play back the recorded pictures on other video equipment, the picture may jitter.

Using with analog video unit and PC

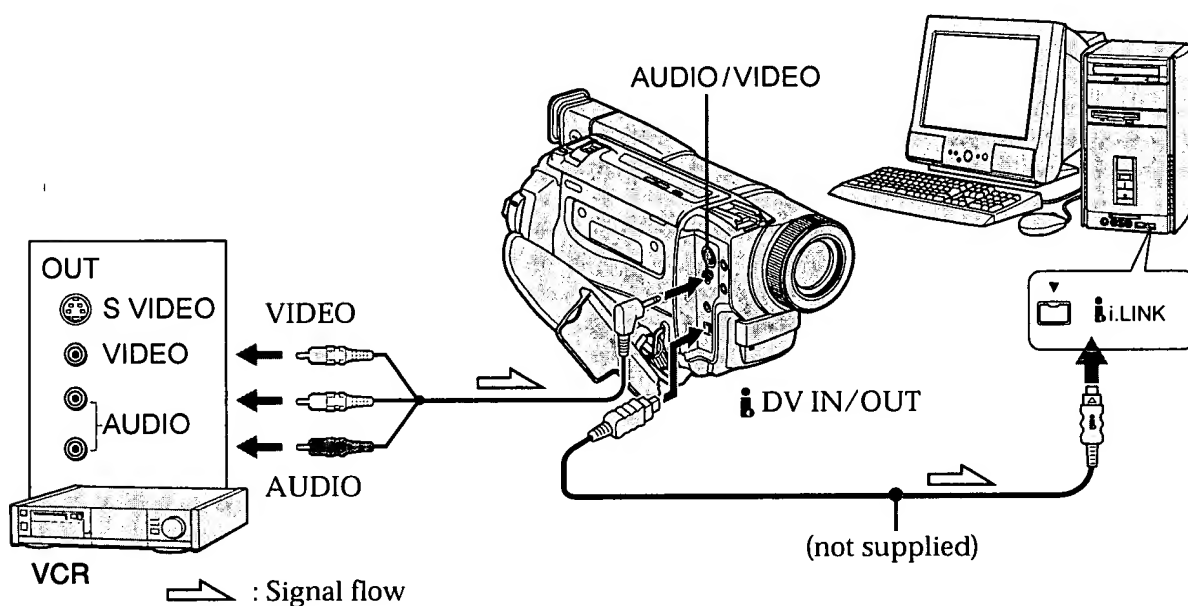
- Signal convert function

You can capture images and sound from an analog video unit connected to a PC which has the i. LINK (DV) jack to your camcorder.

Analog video signals → Digital video signals

- (1) Set the POWER switch to VTR.
- (2) Set A/V → DV OUT to ON in the menu settings. (P. 63)
- (3) Start playback on the analog video unit.
- (4) Start capturing procedures on your PC.

The operation procedures depend on your PC and the software which you use. For details on how to capture images, refer to the instruction manual of the software.



After capturing images and sound

Stop capturing procedures on your PC, and stop the playback on the analog video unit.

Notes

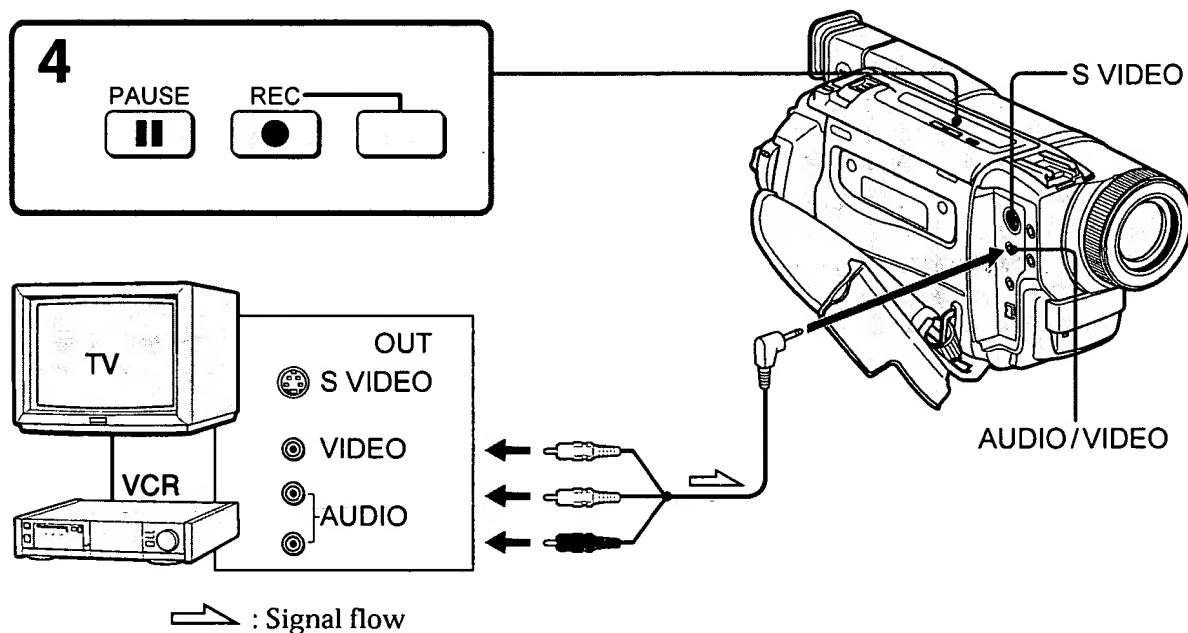
- You need to install software which can exchange video signals.
- Depending on the condition of the analog video signals, the PC may not be able to output the images correctly when you convert analog video signals into digital video signals via your camcorder. Depending on the analog video unit, the image may contain noise or incorrect colors.
- You cannot record or capture the video output via your camcorder when the video includes copyright protection signals such as ID-2 system.

Recording video or TV programs

Using the A/V connecting cable

You can record a tape from another VCR or a TV program from a TV that has video/audio outputs. Use your camcorder as a recorder.

- (1) Insert a blank tape (or a tape you want to record over) into your camcorder. If you are recording a tape from the VCR, insert a recorded tape into the VCR.
- (2) Set the POWER switch to VTR.
- (3) Set DISPLAY to LCD in the menu settings (p. 63).
- (4) Press **●** REC and the button on its right simultaneously on your camcorder, then immediately press **||** on your camcorder.
- (5) Press **▶** on the VCR to start playback if you are recording a tape from VCR. Select a TV program if you are recording from TV.
The picture from a TV or VCR appears on the LCD screen or in the viewfinder.
- (6) Press **||** on your camcorder at the scene where you want to start recording from.



When you have finished dubbing a tape

Press **■** on both your camcorder and the VCR.

Notes

- To enable smooth transition, we recommend that you do not mix pictures recorded in the Hi8/standard 8 with the Digital8 **B** system on a tape.
- If you fast-forward or slow-playback on the other equipment, the image being recorded may fluctuate. When recording from other equipment, be sure to play back the original tape at normal speed.

If your VCR is a monaural type

Connect the yellow plug of the A/V connecting cable to the video output jack and the white or the red plug to the audio output jack on the VCR or the TV. When the white plug is connected, the left channel audio is output, and the red plug is connected, the right channel audio is output.

If your TV or VCR has an S video jack


Connect using an S video cable (not supplied) to obtain high-quality pictures.





With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.

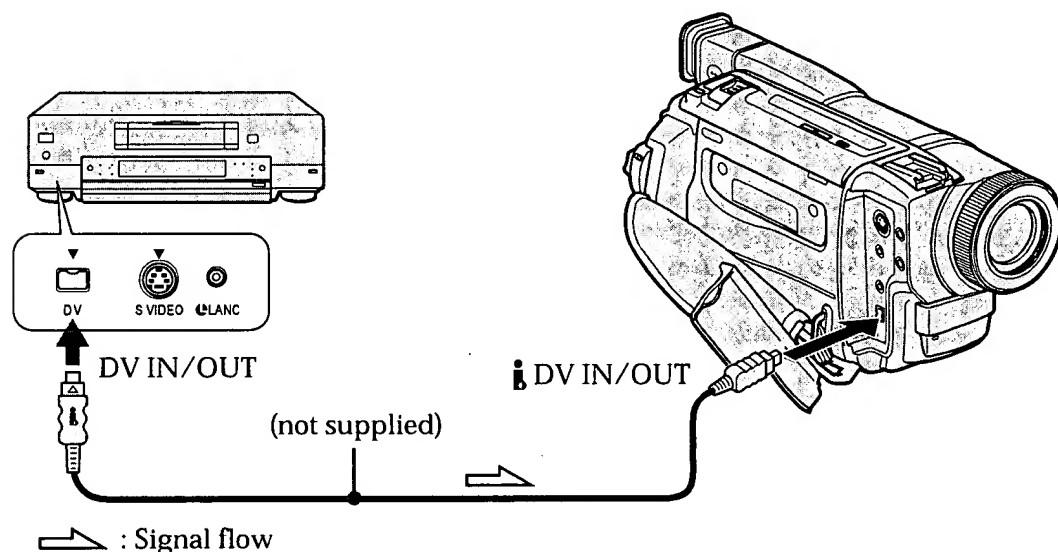
Connect an S video cable (not supplied) to the S video jacks of both your camcorder and the TV or VCR.

Recording video or TV programs


Using the i.LINK cable (DV connecting cable)

Simply connect the i.LINK cable (DV connecting cable) (not supplied) to  DV IN/OUT and to DV IN/OUT of the DV products. With digital-to-digital connection, video and audio signals are transmitted in digital form for high-quality editing.

- (1) Insert a blank tape (or a tape you want to record over) into your camcorder, and insert the recorded tape into the VCR.
- (2) Set the POWER switch to VTR.
- (3) Set DISPLAY to LCD in the menu settings (p. 63).
- (4) Press  REC and the button on its right simultaneously on your camcorder, then immediately press  on your camcorder.
- (5) Press  on the VCR to start playback.
The picture from a TV or VCR appears on the LCD screen or in the viewfinder.
- (6) Press  on your camcorder at the scene where you want to start recording from.



When you have finished dubbing a tape

Press  on both your camcorder and the VCR.

You can connect one VCR only using the i.LINK cable (DV connecting cable).

During digital editing

The color of the display may be uneven. However this does not affect the dubbed picture.

If you record playback pause picture with the DV IN/OUT jack

The recorded picture becomes rough. And when you play back the picture using your camcorder, the picture may jitter.

Before recording

Make sure if the DV IN indicator appears on the LCD screen or in the viewfinder by pressing DISPLAY. The DV IN indicator may appear on both equipment.

Inserting a scene from a VCR

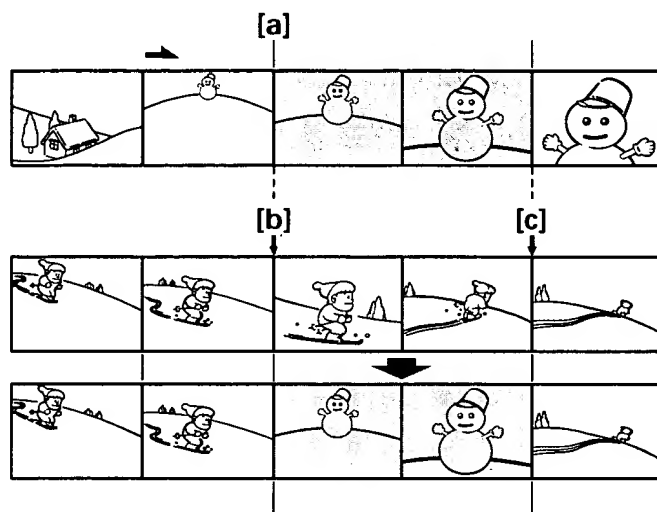
- Insert Editing

You can insert a new scene from a VCR onto your originally recorded tape by specifying the insert start and end points.

Use the Remote Commander for this operation.

Connections are the same as in "Recording video or TV programs" on page 59, 60.

Insert a cassette containing the desired scene to insert into the VCR.

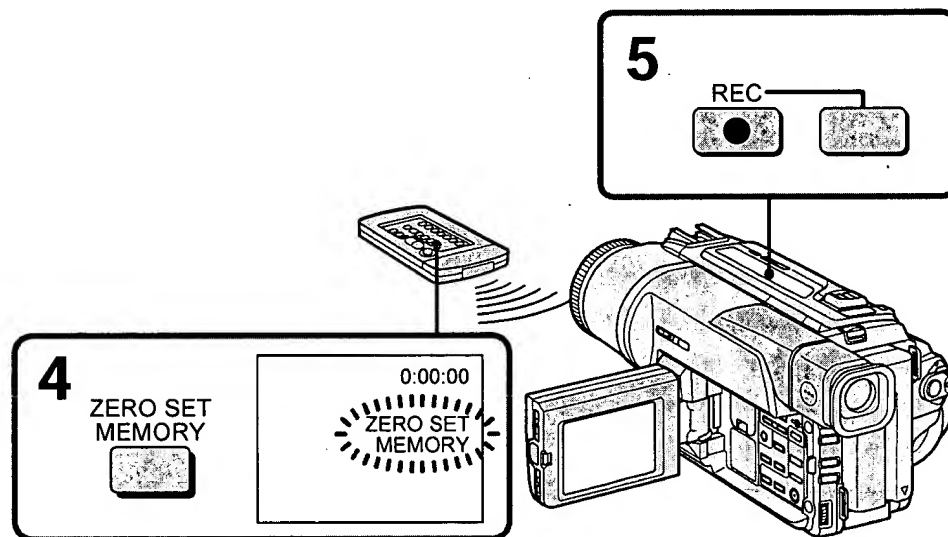


Editing

Inserting a scene from a VCR – Insert Editing

- (1) Set the POWER switch to VTR.
- (2) On the VCR, locate just before the insert start point [a], then press **II** to set the VCR to the playback pause mode.
- (3) On your camcorder, locate the insert end point [c] by pressing **◀◀** or **▶▶**. Then press **II** to set it to the playback pause mode.
- (4) Press ZERO SET MEMORY on the Remote Commander. The ZERO SET MEMORY indicator flashes and the end point of the insert is stored in memory.
- (5) On your camcorder, locate the insert start point [b] by pressing **◀◀**, then press **●** REC and the button on its right simultaneously to set your camcorder to the recording pause mode.
- (6) First press **II** on the VCR, and after a few seconds press **II** on your camcorder to start inserting the new scene.

Inserting automatically stops near the zero point on the counter. Your camcorder automatically stops. The end point [c] of the insert stored in memory is canceled.



To change the insert end point

Press ZERO SET MEMORY again after step 5 to erase the ZERO SET MEMORY indicator and begin from step 3.

Notes

- The zero set memory function works only for tapes recorded in the Digital8 **D** system.
- The picture and sound recorded on the section between the insert start and end points will be erased when you insert the new scene.

When the inserted picture is played back

The picture may be distorted at the end of the inserted section. This is not a malfunction.


To insert a scene without setting the insert end point

Skip step 3 and 4. Press **■** when you want to stop inserting.

Changing the menu settings

To change the mode settings in the menu settings, select the menu items with the SEL/PUSH EXEC dial. The default settings can be partially changed.

First, select the icon, then the menu item and then the mode.

- (1) In CAMERA, VTR or MEMORY (DCR-TRV320 only) mode, press MENU.
- (2) Turn the SEL/PUSH EXEC dial to select the desired icon, then press the dial to set.
- (3) Turn the SEL/PUSH EXEC dial to select the desired item, then press the dial to set.
- (4) Turn the SEL/PUSH EXEC dial to select the desired mode, and press the dial to set.
- (5) If you want to change other items, select  RETURN and press the dial, then repeat steps from 2 to 4.

For details, see "Selecting the mode setting of each item" (p. 64).

1

CAMERA

MANUAL SET
◀ AUTO SHTR

[MENU] : END

VTR

VTR SET
▶ HiFi SOUND
TBC
DNR
AUDIO MIX
PB MODE
AV→DV OUT

[MENU] : END

MEMORY

CAMERA SET
▶ D ZOOM
STEADYSHOT
N. S. LIGHT

[MENU] : END

(DCR-TRV320 only)

2

MANUAL SET
◀ AUTO SHTR

OTHERS
WORLD TIME
BEEP
COMMANDER
DISPLAY
REC LAMP
ETC ▶ INDICATOR

3

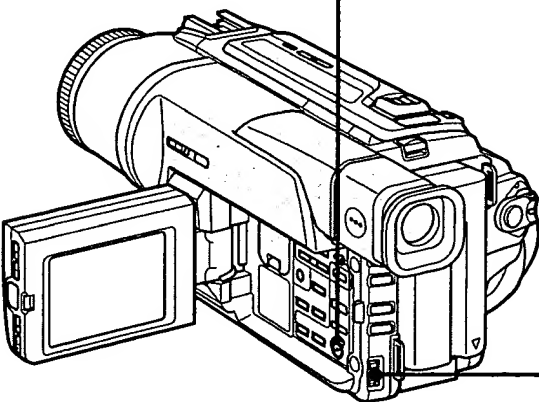
OTHERS
WORLD TIME 0 HR
BEEP

OTHERS
WORLD TIME
BEEP
COMMANDER ON
DISPLAY
REC LAMP
ETC ▶ INDICATOR
▶ RETURN

4

MANUAL SET
◀ WORLD TIME
BEEP
COMMANDER ON
DISPLAY OFF
REC LAMP
INDICATOR
▶ RETURN









OTHERS
WORLD TIME
BEEP
COMMANDER OFF
DISPLAY
REC LAMP
ETC ▶ INDICATOR
▶ RETURN



To make the menu display disappear
Press MENU.



Changing the menu settings

Menu items are displayed as the following icons:

-  MANUAL SET
-  CAMERA SET
-  VTR SET
-  LCD SET
-  MEMORY SET (DCR-TRV320 only)
-  TAPE SET
-  SETUP MENU
-  OTHERS

Selecting the mode setting of each item ● is the default setting.


Menu items differ according to the position of the POWER switch.
The LCD screen and the viewfinder show only the items you can operate at the moment.

Icon/item	Mode	Meaning	POWER switch
 AUTO SHTR	● ON	To automatically activate the electronic shutter when shooting in bright conditions	CAMERA
	OFF	To not automatically activate the electronic shutter even when shooting in bright conditions	
 D ZOOM	OFF	To deactivate digital zoom. Up to 25× zoom is carried out.	CAMERA MEMORY
	50×	To activate digital zoom. More than 25× to 50× zoom is performed digitally. (p. 17)	
	● 450×	To activate digital zoom. More than 25× to 450× zoom is performed digitally. (p. 17)	
16:9WIDE	● OFF	—	CAMERA
	ON	To record a 16:9 wide picture (p. 31)	
STEADYSHOT	● ON	To compensate for camera-shake	CAMERA MEMORY
	OFF	To cancel the SteadyShot function. Natural pictures are produced when shooting a stationary object with a tripod.	
N.S. LIGHT	● ON	To use the NightShot Light function (p. 19)	CAMERA MEMORY
	OFF	To cancel the NightShot Light function	




Notes on the SteadyShot function

- The SteadyShot function will not correct excessive camera-shake.
- Attachment of a conversion lens (not supplied) may influence the SteadyShot function.

If you cancel the SteadyShot function


The SteadyShot off indicator  appears. Your camcorder prevents excessive compensation for camera-shake.

Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
 HiFi SOUND	● STEREO	To play back a stereo tape or dual sound track tape with main and sub sound. (p. 102)	VTR
	1	To play back a stereo tape with the left sound or a dual sound tape with main sound.	
	2	To play back a stereo tape with the right sound or a dual sound track tape with sub sound.	
TBC*	● ON	To correct jitter	VTR
	OFF	To not correct jitter. Set TBC to OFF when playing back a tape on which you have dubbed over and recorded the signal of a TV game or similar machine.	
TBC stands for "Time Base Corrector".			
DNR*	● ON	To reduce picture noise	VTR
	OFF	To reduce a conspicuous afterimage when the picture has a lot of movement	
DNR stands for "Digital Noise Reduction".			
AUDIO MIX	———	To adjust the balance between the stereo 1 and stereo 2	VTR
<div><div></div><div>ST1▲ST2</div></div>			
PB MODE	● AUTO	To automatically select the system (Hi8/standard 8 or Digital8 ) that was used to record on the tape, and play back the tape	VTR
		To play back a tape that was recorded in the Hi8/standard 8 system when your camcorder does not automatically distinguish the recording system	
A/V → DV OUT	● OFF	To convert digital video signals into analog video signals via your camcorder.	VTR
	ON	To convert analog video signals into digital video signals via your camcorder. "A/V → DV" appears on the LCD screen or in the viewfinder. (P. 58)	

* When you play back tapes recorded in the Hi8/standard 8 system only.

Notes on AUDIO MIX




- When playing back a tape recorded in the 16-bit mode, you cannot adjust the balance.
- You can adjust the balance only for tapes recorded in the Digital8  system.

Note on PB MODE

The mode will return to the default setting when:

- you remove the battery pack or power source.
- you turn the POWER switch.

Changing the menu settings


Icon/item	Mode	Meaning	POWER switch
 LCD B. L.	<ul style="list-style-type: none"> ● BRT NORMAL BRIGHT 	<p>To set the brightness on the LCD screen normal</p> <p>To brighten the LCD screen</p>	VTR CAMERA MEMORY
LCD COLOR		<p>To adjust the color on the LCD screen, turning the SEL/PUSH EXEC dial to adjust the following bar</p> <div style="text-align: center;">  </div> <p style="text-align: center;">to lighten ← → to darken</p>	VTR CAMERA MEMORY
 CONTINUOUS*	<ul style="list-style-type: none"> ● OFF MULTI SCRN 	<p>Not to record continuously</p> <p>To record 9 images continuously (p. 77)</p>	MEMORY
QUALITY*	<ul style="list-style-type: none"> ● FINE STANDARD 	<p>To record still images in the fine image quality mode, using the "Memory Stick"</p> <p>To record still images in the standard image quality mode, using the "Memory Stick"</p>	VTR MEMORY
FLD./FRAME*	<ul style="list-style-type: none"> ● FIELD FRAME 	<p>To record moving subjects</p> <p>To record stopping subjects in high quality</p>	MEMORY
PRINT MARK*	<ul style="list-style-type: none"> ● OFF ON 	<p>To cancel print marks on still images.</p> <p>To write a print mark on the recorded still images you want to print out later</p>	VTR MEMORY
PROTECT*	<ul style="list-style-type: none"> ● OFF ON 	<p>To cancel print marks on still images.</p> <p>To protect selected still images against accidental erasure (p. 96)</p>	VTR MEMORY
SLIDE SHOW*	———	To play back images in a continuous loop (p. 94)	MEMORY
DELETE ALL*	———	To delete all the images (p. 98)	VTR MEMORY
FORMAT*	<ul style="list-style-type: none"> ● RETURN FORMAT 	<p>To cancel formatting.</p> <p>To format an inserted "Memory Stick."</p> <p>1. Select FORMAT with the SEL/PUSH EXEC dial, then press the dial.</p> <p>2. Turn the SEL/PUSH EXEC dial to select FORMAT, then press the dial.</p> <p>3. After EXECUTE appears, press the SEL/PUSH EXEC dial. FORMATTING appears during formatting. COMPLETE appears when formatting is finished.</p>	VTR MEMORY
PHOTO SAVE*	———	To duplicate still images (p. 86)	VTR

* DCR-TRV320 only

Notes on LCD B.L.

- When you select BRIGHT, battery life is reduced by about 10 percent during recording.
- When you use power sources other than the battery pack, BRIGHT is automatically selected.

Notes on formatting



- Supplied or optional "Memory Stick"s have been formatted at factory. Formatting with this camcorder is not required.
- Do not turn the POWER switch or press any button while the display shows FORMATTING.
- You cannot format the "Memory Stick" if the write-protect tab on the "Memory Stick" is set to LOCK.
- Format again if the message  appears.

Formatting erases all information on the "Memory Stick"



Check the contents of the "Memory Stick" before formatting.

- Formatting erases sample images on the "Memory Stick."
- Formatting erases the protected image data on the "Memory Stick."

Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
 REC MODE	● SP	To record in the SP (Standard Play) mode	VTR CAMERA
	LP	To increase the recording time to 1.5 times the SP mode	
AUDIO MODE	● 12BIT	To record or play back in the 12-bit mode (two stereo sounds)	VTR* CAMERA
	16BIT	To record or play back in the 16-bit mode (the one stereo sound with high quality)	
 REMAIN	● AUTO	To display the remaining tape bar: • for about 8 seconds after your camcorder is turned on and calculates the remaining amount of tape • for about 8 seconds after a cassette is inserted and your camcorder calculates the remaining amount of tape • for about 8 seconds after ► is pressed in VTR mode • for about 8 seconds after DISPLAY is pressed to display the screen indicators • for the period of tape rewinding, forwarding or picture search in the VTR mode	VTR CAMERA
	ON	To always display the remaining tape bar	
DATA CODE	● DATE/CAM	To display date, time and recording data during playback	VTR
	DATE	To display date and time during playback	

Note on REC MODE

When you record on the standard 8  tape, your camcorder records in the SP mode even you select the LP mode in the menu settings. In this case, the indicator "8mm TAPE → SP REC, Hi8 TAPE → LP/SP REC" appears on the LCD screen or in the viewfinder. Use the Hi8  tapes for the LP mode.


Notes on the LP mode

- When you record a tape in the LP mode on your camcorder, we recommend playing the tape on your camcorder. When you play back the tape on other camcorders or VCRs, noise may occur in images or sound.
- When you record in the SP and LP modes on one tape or you record some scenes in the LP mode, the playback image may be distorted or the time code may not be written properly between scenes.


Note on AUDIO MODE

When playing back a tape recorded in the 16-bit mode, you cannot adjust the balance in AUDIO MIX.

*To dub a tape to another VCR

You cannot select AUDIO MODE for tapes recorded in the Digital8  system. You, however, can select AUDIO MODE when you dub tapes recorded in the Hi8/standard 8 system to another VCR using the i.LINK cable.


Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
 CLOCK SET	---	To reset the date or time (p. 70)	CAMERA MEMORY
AUTO TV ON	● OFF	—	VTR CAMERA MEMORY
	ON	To automatically turn on the Sony TV when using the super laser link function	
TV INPUT	● VIDEO1 VIDEO2 VIDEO3	To switch the video input on a Sony TV when using the super laser link function (p. 27)	VTR CAMERA MEMORY
	OFF	—	
LTR SIZE	● NORMAL	To display selected menu items in normal size	VTR CAMERA MEMORY
	2×	To display selected menu items at twice the normal size	
DEMO MODE	● ON	To make the demonstration appear	CAMERA
	OFF	To cancel the demonstration mode	

Notes on DEMO MODE

- You cannot select DEMO MODE when a cassette is inserted in your camcorder.
- DEMO MODE is set to STBY (Standby) at the factory and the demonstration starts about 10 minutes after you have set the POWER switch to CAMERA without a cassette inserted.
To cancel the demonstration, insert a cassette, set the POWER switch to other than CAMERA, or set DEMO MODE to OFF.
- When NIGHTSHOT is set to ON, the "NIGHTSHOT" indicator appears on the LCD screen or in the viewfinder and you cannot select DEMO MODE in the menu settings.

Changing the menu settings

Icon/item	Mode	Meaning	POWER switch
 WORLD TIME	———	To set the clock to the local time. Turn the SEL/PUSH EXEC dial to set a time difference. The clock changes by the time difference you set here. If you set the time difference to 0, the clock returns to the originally set time.	CAMERA MEMORY
BEEP	● MELODY	To output the melody when you start/stop recording or when an unusual condition occurs on your camcorder	VTR CAMERA MEMORY
	NORMAL	To output the beep instead of the melody	
	OFF	To cancel all sound including shutter sound	
COMMANDER	● ON	To activate the Remote Commander supplied with your camcorder	VTR CAMERA MEMORY
	OFF	To deactivate the Remote Commander to avoid remote control misoperation caused by other VCR's remote control	
DISPLAY	● LCD	To show the display on the LCD screen and in the viewfinder	VTR CAMERA MEMORY
	V-OUT/LCD	To show the display on the TV screen, LCD screen and in the viewfinder	
REC LAMP	● ON	To light up the camera recording lamp at the front of your camcorder	CAMERA MEMORY
	OFF	To turn the camera recording lamp off so that the subject is not aware of the recording	
INDICATOR	● BL OFF	To turn off the backlight on display window	VTR CAMERA MEMORY
	BL ON	To turn on the backlight	

Note

If you press DISPLAY with DISPLAY set to V-OUT/LCD in the menu settings, the picture from a TV or VCR will not appear on the LCD screen even when your camcorder is connected to outputs on the TV or VCR. (Except when your camcorder is connected with the i.LINK cable.)

In more than 5 minutes after removing the power source

The AUDIO MIX, COMMANDER and HiFi SOUND items are returned to their default settings.

The other menu items are held in memory even when the battery is removed, as long as the lithium battery is installed.

Notes on INDICATOR

- When you select BL ON, battery life is reduced by about 10 percent during recording.
- When you use power sources other than the battery pack, BL ON is automatically selected.


Resetting the date and time

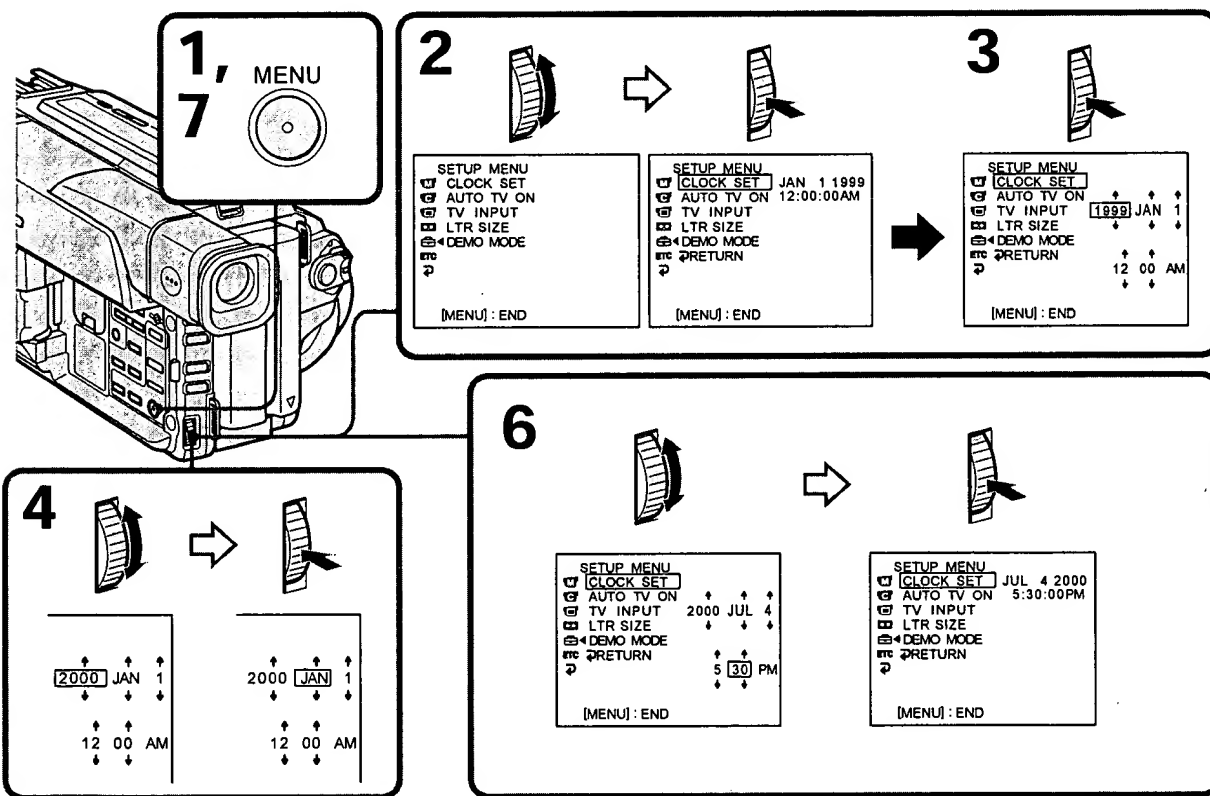
The default clock setting is set to Tokyo time for the models sold in Japan, and to Hong Kong, New York or Panama time for other models.

The date and time are held in memory by the lithium battery. If you replace the lithium battery with the battery pack or other power source connected, you need not reset the date and time.

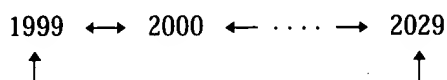
You must reset the date and time when the lithium battery becomes dead with no power source installed.

First, set the year, then the month, the day, the hour and then the minute.

- (1) While the camcorder is in the standby mode, press MENU to display the menu settings.
- (2) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (3) Turn the SEL/PUSH EXEC dial to select CLOCK SET, then press the dial.
- (4) Turn the SEL/PUSH EXEC dial to adjust the desired year, then press the dial.
- (5) Set the month, day and hour by turning the SEL/PUSH EXEC dial and pressing the dial.
- (6) Set the minute by turning the SEL/PUSH EXEC dial and pressing the dial by the time signal. The clock starts to move.
- (7) Press MENU to make the menu settings disappear.



The year changes as follows:



If you do not set the date and time

"-----" "--:--:--" is recorded on the tape and the "Memory Stick" (DCR-TRV320 only).

Note on the time indicator

The internal clock of your camcorder operates on a 12-hour cycle.

- 12:00 AM stands for midnight.
- 12:00 PM stands for noon.

Using “Memory Stick”—introduction

- DCR-TRV320 only

You can record and play back still images on the “Memory Stick” supplied with your camcorder. You can easily play back, record or delete still images. You can exchange image data with other equipment such as a personal computer etc., using the serial port adaptor for “Memory Stick” (not supplied) or PC card adaptor for “Memory Stick” (not supplied).

On file format (JPEG)

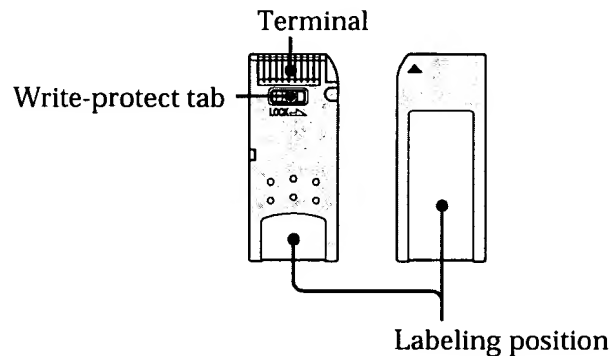
Your camcorder compresses image data in JPEG format (extension .jpg).

Typical image data file name

100-0001: This file name appears on the LCD screen or in the viewfinder of your camcorder.

Dsc00001.jpg: This file name appears on the display of your personal computer.

Before using “Memory Stick”



- You cannot record or erase still images when the write-protect tab on the “Memory Stick” is set to LOCK.
- We recommend backing up important data.
- Image data may be damaged in the following cases:
 - If you remove the “Memory Stick”, turn the power off, or detach the battery for replacement when the access lamp is flashing
 - If you use “Memory Stick”s under circumstances affected by static electricity or magnetic field.
- Prevent metallic objects or your finger from coming into contact with the metal parts of the connecting section.
- Stick its label on the labeling position.
- Do not bend, drop or apply strong shock to “Memory Stick”s.
- Do not disassemble or modify “Memory Stick”s.
- Do not let “Memory Stick”s get wet.
- Do not use or keep “Memory Stick”s in locations that are:
 - Extremely hot such as in a car parked in the sun or under the scorching sun
 - Under direct sunlight
 - Very humid or subject to corrosive gases
- When you carry or store a “Memory Stick”, put it in its case.


Using "Memory Stick"-introduction

"Memory Stick"s formatted by a computer

"Memory Stick"s formatted by Windows OS or Macintosh computers do not have a guaranteed compatibility with this camcorder.

Notes on image data compatibility

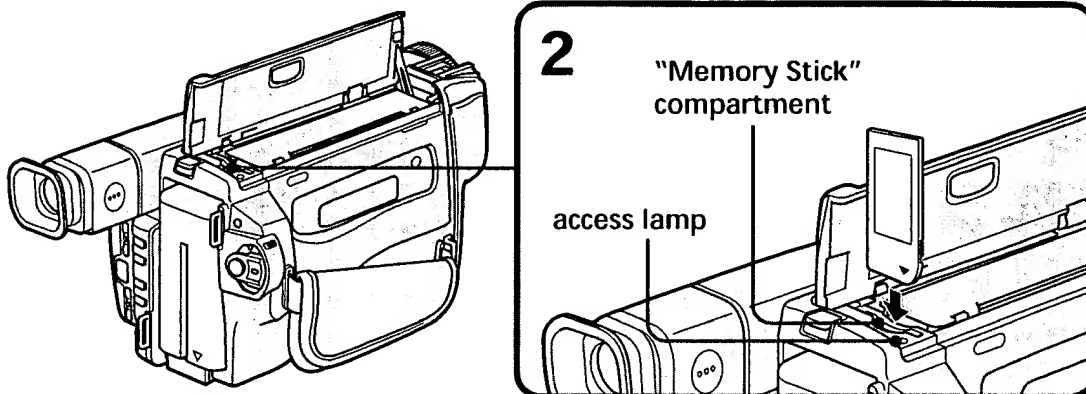
- Image data files recorded on "Memory Stick"s by your camcorder conform with the Design Rules for Camera File Systems universal standard established by the JEIDA (Japan Electronic Industry Development Association). You cannot play back on your camcorder still images recorded on other equipment (DCR-TRV890E/TRV900/TRV900E or DSC-D700/D770) that does not conform with this universal standard. (These models are not sold in some areas.)
- If you cannot use the "Memory Stick" that has been used on other equipment, format the "Memory Stick" on your camcorder following the steps on page 66. Note that all images on the "Memory Stick" will be deleted if you format it.

"Memory Stick" and  are trademarks of Sony Corporation.

Using "Memory Stick"–introduction

Inserting "Memory Stick"

- (1) Open the lid of the cassette compartment.
- (2) Insert the "Memory Stick" with the ▲ mark facing toward the "Memory Stick" compartment as illustrated until it clicks.
- (3) Close the lid of the cassette compartment.



To eject the "Memory Stick"

Open the lid of the cassette compartment, then press the "Memory Stick" once lightly. The "Memory Stick" pops up.

When the access lamp is lit or flashing


Do not shake or strike your camcorder. Do not turn the power off, eject the "Memory Stick" or remove the battery pack. Otherwise, the image data breakdown may occur.

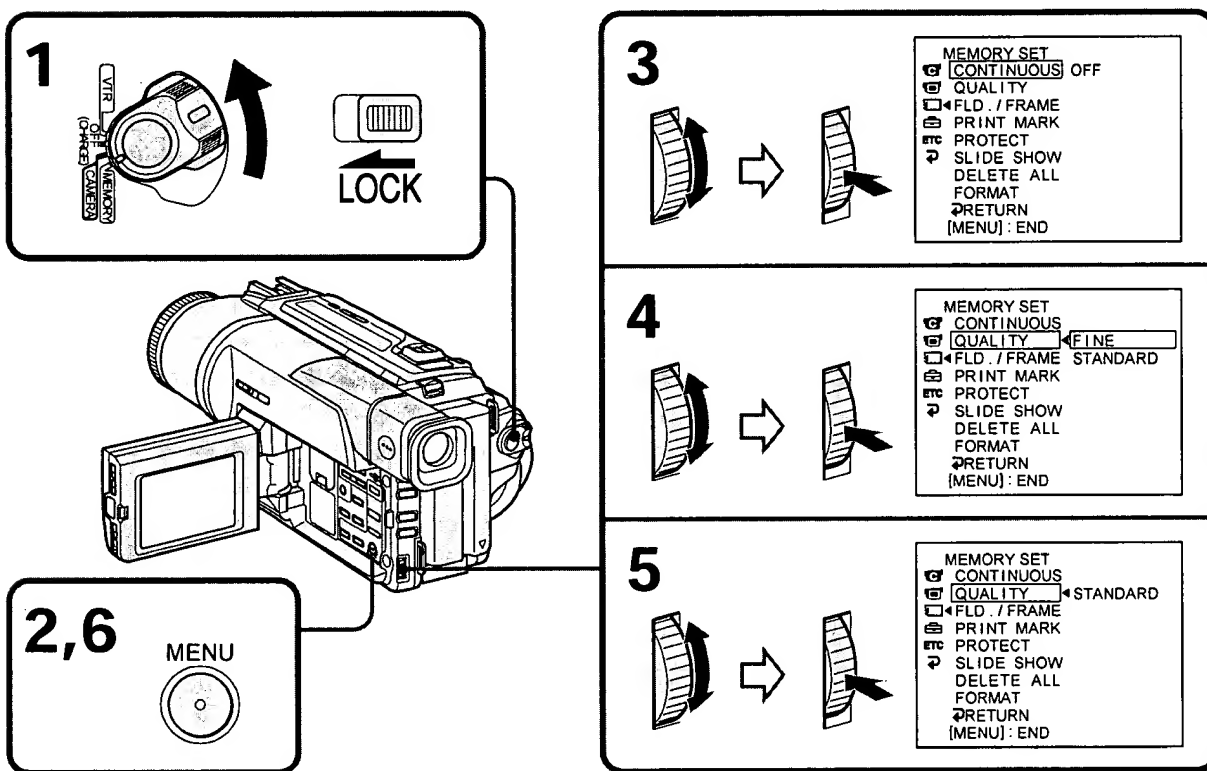
"Memory Stick" operations

Using "Memory Stick"–introduction

Selecting image quality mode

You can select image quality mode in still image recording. Default setting is FINE.

- (1) Set the POWER switch to VTR or MEMORY. Make sure that the LOCK is set to the right (unlock) position.
- (2) Press MENU to make the menu display appear.
- (3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (4) Turn the SEL/PUSH EXEC dial to select QUALITY, then press the dial.
- (5) Turn the SEL/PUSH EXEC dial to select the desired image quality, then press the dial.
- (6) Press MENU to erase the menu display.



Note

In some cases, changing the image quality mode may not affect the image quality, depending on the types of images you are shooting.

Using "Memory Stick" -introduction

Image quality settings

Setting	Meaning
FINE (FINE)	Use this mode when you want to record high quality images. The image is compressed to about 1/6.
STANDARD (STD)	This is the standard image quality. The image is compressed to about 1/10.

Differences in image quality mode

Recorded images are compressed in JPEG format before being stored into memory. The memory capacity allotted to each image varies depending on the selected image quality mode. Details are shown in the table below. (The number of pixels is 640×480 , regardless of image quality mode. The data size before compression is about 600 KB.)

Image quality mode	Memory capacity
FINE	About 100 KB
STANDARD	About 60 KB

Approximate number of images you can record on a "Memory Stick"

The approximate number of images you can record on a "Memory Stick" formatted using this camcorder varies depending on which image quality mode you select and the complexity of the subject.

Maximum number of images you can record on a "Memory Stick"

Setting	4MB (supplied)	8MB	16MB	32MB	64MB
FINE	40	81	164	329	659
STANDARD	60	122	246	494	988

Note on the image quality mode indicator

This is only displayed during recording.

Recording still images on "Memory Stick" – Memory Photo recording

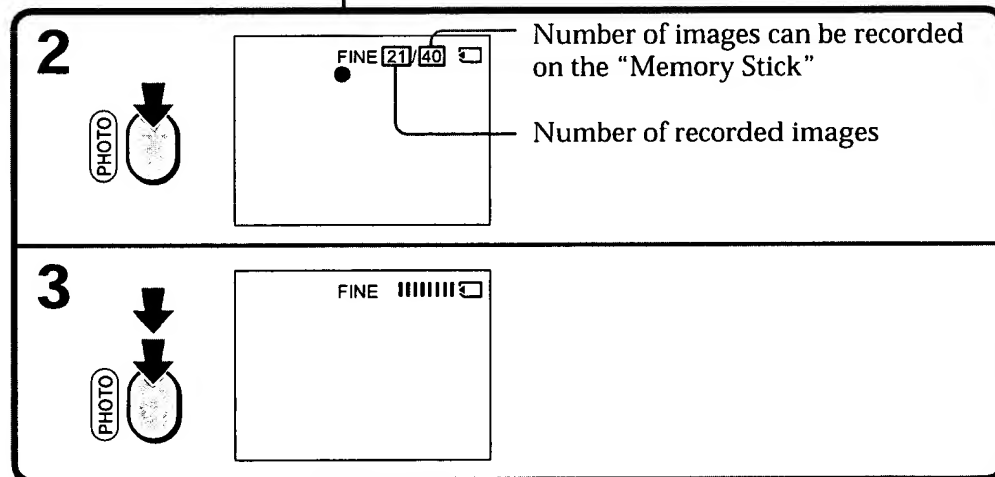
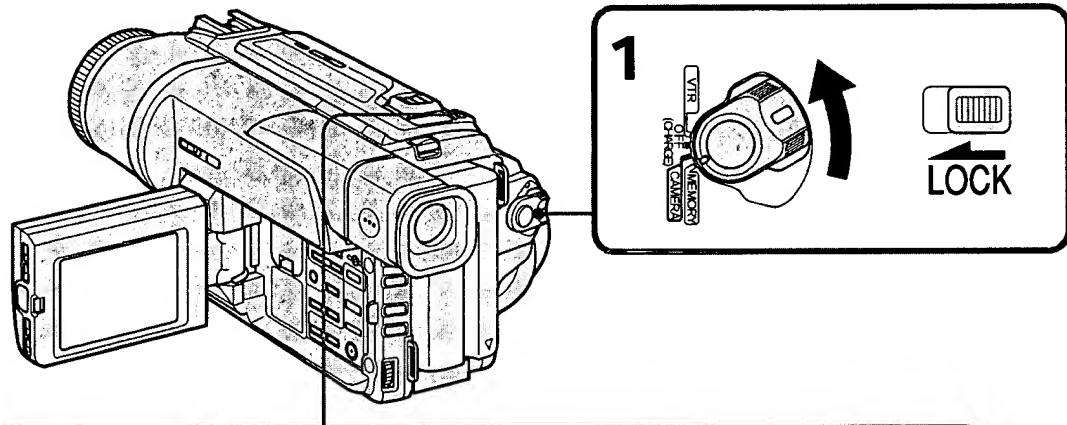
- DCR-TRV320 only

You can select the FIELD or FRAME mode in still image recording. Your camcorder compensates for camera-shake when recording moving subjects in the FIELD mode. Your camcorder records still images in high quality in the FRAME mode. Select the FIELD or FRAME in the menu settings (p. 63).

Before operation

Insert a "Memory Stick" into your camcorder.

- (1) Set the POWER switch to MEMORY. Make sure that the LOCK is set to the right (unlock) position.
- (2) Keep pressing PHOTO lightly. The green ● mark stops flashing, then lights up. The brightness of the image and focus are adjusted, being targeted for the middle of the image and are fixed. Recording does not start yet.
- (3) Press PHOTO deeper. The image displayed on the screen will be recorded on the "Memory Stick". Recording is complete when the bar scroll indicator disappears.



Notes

- When recording fast-moving subjects in the FRAME mode, the recorded image blurry.
- When recording in the FRAME mode, your camcorder may not correct camera-shake. We recommend that you shoot objects with a tripod.
- When recording still images at step 2 with the PHOTO button pressed lightly, the image momentarily flickers. This is not a malfunction.
- Before you shoot in autofocus mode, check that the subject is in sharp focus.
- The brightness of the picture and focus are adjusted on the center portion of the image.

Recording still images on "Memory Stick" - Memory Photo recording

When the POWER switch is set to MEMORY

The following functions do not work:

wide mode, digital effect, picture effect, title, low lux mode of PROGRAM AE.

When you are recording a still image

You can neither turn off the power nor press PHOTO.

When you press the PHOTO button on the Remote Commander

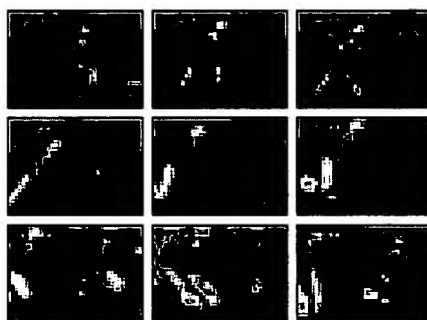
Your camcorder immediately records the image that is on the screen when you press the button.

Recording images continuously


You can record still images continuously.

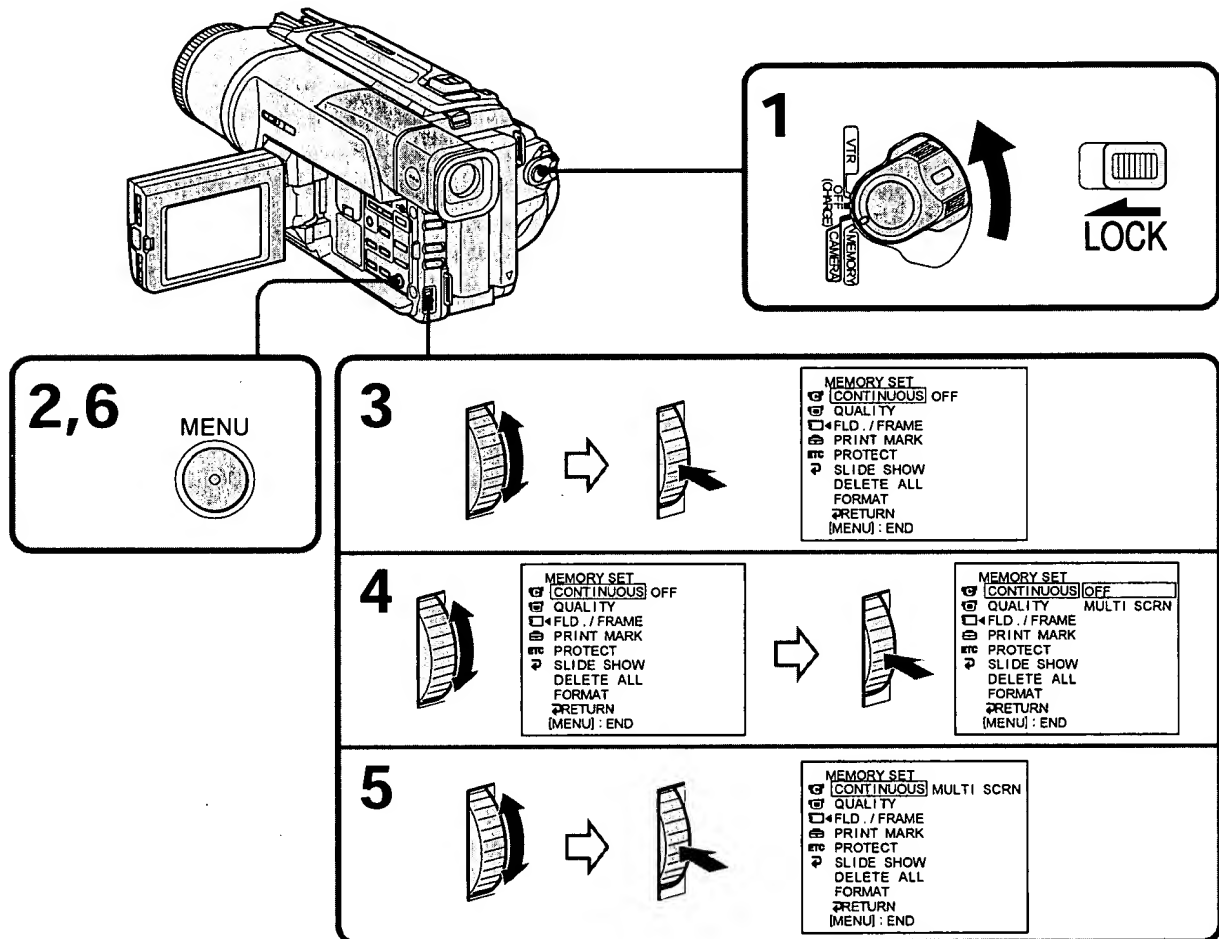
Multi screen mode

You can record 9 still images continuously on a single page.



Recording still images on "Memory Stick" - Memory Photo recording

- (1) Set the POWER switch to MEMORY. Make sure that the LOCK is set to the right (unlock) position.
- (2) Press MENU to make the menu display appear.
- (3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (4) Turn the SEL/PUSH EXEC dial to select CONTINUOUS, then press the dial.
- (5) Turn the SEL/PUSH EXEC dial to select the desired setting, then press the dial.
- (6) Press MENU to erase the menu display.




If the capacity of the "Memory Stick" becomes full

"FULL" appears on the LCD screen or in the viewfinder, and you cannot record still images on the "Memory Stick"

Recording still images on "Memory Stick" - Memory Photo recording

Continuous shooting settings

Setting	Meaning (indicator on the screen)
OFF	Your camcorder shoots one image at a time. (no indicator)
MULTI SCRN	Your camcorder shoots 9 still images at about 0.5 sec intervals and displays the images on a single page divided into 9 boxes. ()

Note on using the video flash light (not supplied)

The video flash light does not work in the multi screen mode if you install it to the accessory shoe.



When recording in the multi screen mode

The image is recorded in the FIELD mode automatically even you select the FRAME mode in the menu settings.

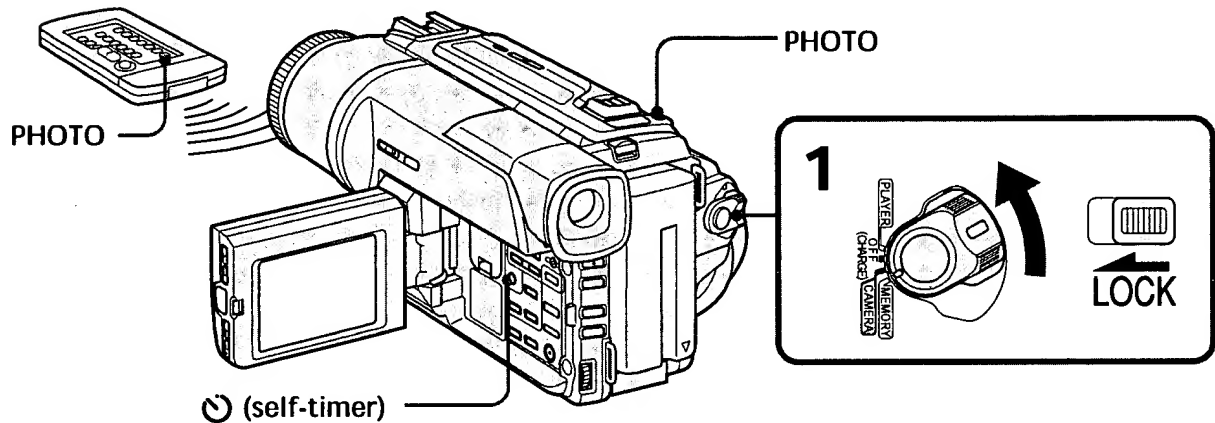
Recording still images on "Memory Stick" - Memory Photo recording

Self-timer memory photo recording



You can record still images on "Memory Stick"s with the self-timer. This mode is useful when you want to record yourself. You can also use the Remote Commander for this operation.

- (1) Set the POWER switch to MEMORY or VTR. Make sure that the LOCK is set to the right (unlock) position.
- (2) Press  (self-timer). The  (self-timer) indicator appears on the LCD screen or in the viewfinder.
- (3) Press PHOTO firmly.

Self-timer starts counting down from 10 with a beep sound. In the last two seconds of the countdown, the beep sound gets faster, then recording starts automatically.



To cancel self-timer recording

Press  (self-timer) so that the  indicator disappears from the LCD or viewfinder screen while your camcorder is in the standby mode. You cannot stop the recording with the Remote Commander.

Note

The self-timer recording mode is automatically cancelled when:

- Self-timer recording is finished.
- The POWER switch is set to OFF (CHARGE) or VTR.

Superimposing a still image in the "Memory Stick" on a moving image - MEMORY MIX

- DCR-TRV320 only

You can superimpose a still image you have recorded on the "Memory Stick" on top of the moving image you are recording.

M. CHROM (Memory chroma key)

You can swap a blue area of a still image such as an illustration or a frame with a moving image.

M. LUMI (Memory luminance key)

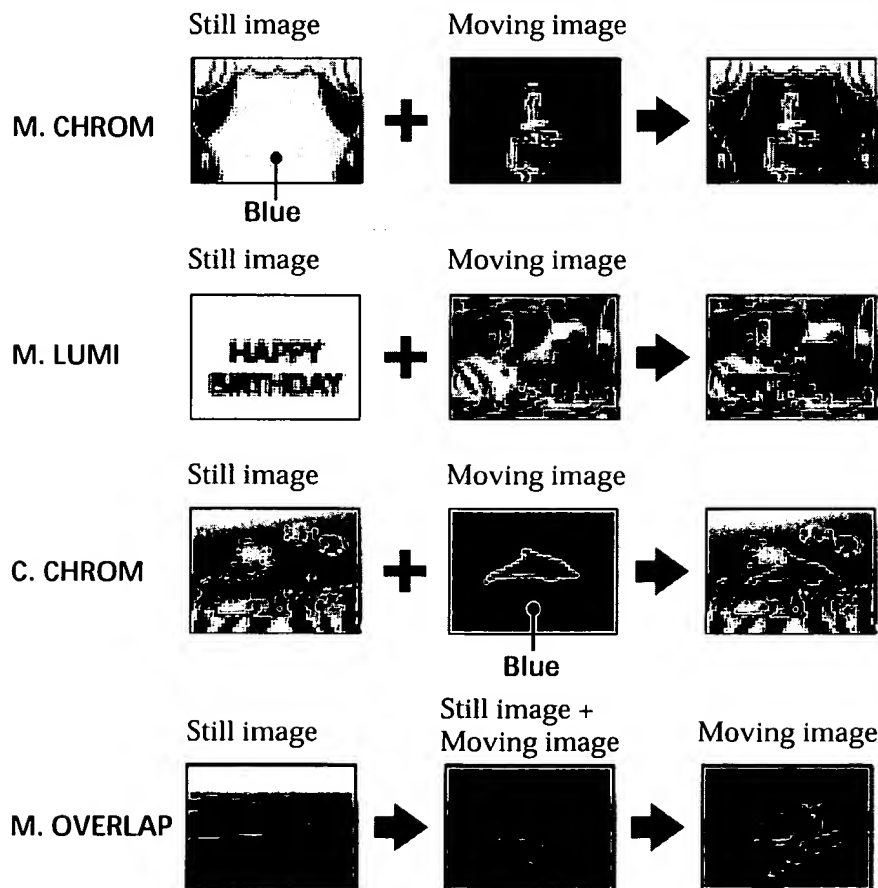
You can swap a brighter area of a still image such as a handwritten illustration or title with a moving image. Record a title on the "Memory Stick" before a trip or event for convenience.

C. CHROM (Camera chroma key)

You can superimpose a moving image on top of a still image such as an image can be used as background. Shoot the subject against a blue background. The blue area of the moving image will be swapped with a still image.

M. OVERLAP (Memory overlap)

You can make a moving image fade in on top of a still image.



"Memory Stick" operations

Superimposing a still image in the "Memory Stick" on a moving image - MEMORY MIX

Before operation

Insert a Hi8 **Hi8**/Digital8 **D** tape for recording and a "Memory Stick" into your camcorder.

- (1) Set the POWER switch to CAMERA.
- (2) Press MEMORY MIX in the standby mode.
The last recorded or last composed image appears on the lower part of the screen as a thumbnail image.
- (3) Press MEMORY+/- to select the still image you want to superimpose.
To see the previous image, press MEMORY -. To see the next image, press MEMORY+.
- (4) Turn the SEL/PUSH EXEC dial to select the desired mode.
The mode changes as follows:
M. CHROM ↔ M. LUMI ↔ C. CHROM ↔ M. OVERLAP
- (5) Press the SEL/PUSH EXEC dial.
The still image is superimposed on the moving image.
- (6) Turn the SEL/PUSH EXEC dial to adjust the effect.

M. CHROM - The color (blue) scheme of the area in the still image which is to be swapped with a moving image

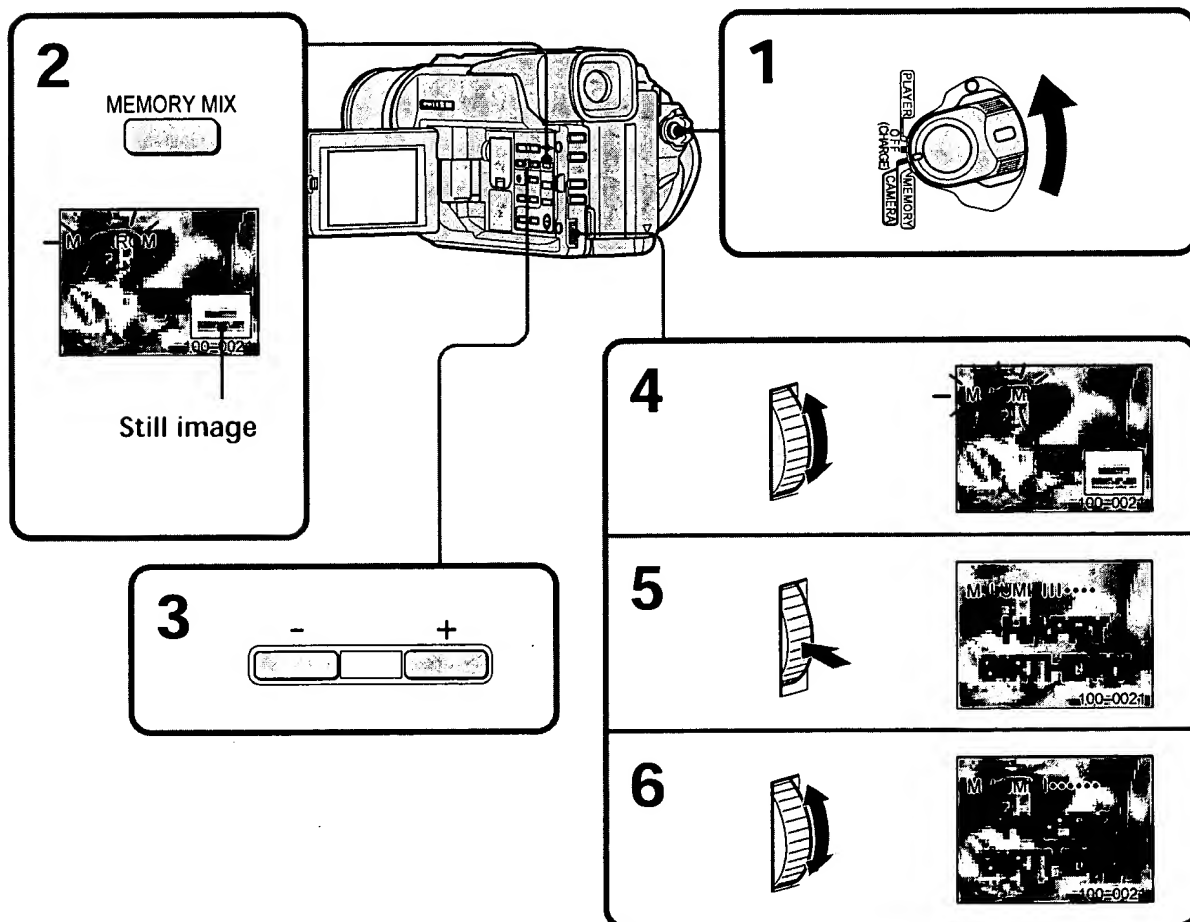
M. LUMI - The color (bright) scheme of the area in the still image which is to be swapped with a moving image

C. CHROM - The color (blue) scheme of the area in the moving image which is to be swapped with a still image

M. OVERLAP - No adjustment necessary

The fewer bars there are on the screen, the stronger the effect.

- (7) Press START/STOP to start recording.



Superimposing a still image in the "Memory Stick" on a moving image - MEMORY MIX

To change the still image to superimpose

Do either of the following:

- Press MEMORY+/- before step 7.
- Press the SEL/PUSH EXEC dial before step 7, and repeat the procedure from step 4.

To change the mode setting

Press the SEL/PUSH EXEC dial before step 7, and repeat the procedure from step 4.

To cancel M. CHROM/M. LUMI/C. CHROM/M.OVERLAP

Press MEMORY MIX.

During recording

You cannot change the mode setting.

The "Memory Stick" supplied with your camcorder stores 20 images

- For M. CHROM: 18 images (such as a frame) 100-0001~100-0018
- For C. CHROM: 2 images (such as a background) 100-0019~100-0020

Sample images

Sample images stored in the "Memory Stick" supplied with your camcorder are protected (p. 96).

When you select M.OVERLAP

You cannot change the still image or the mode setting.

Recording an image from a tape as a still image

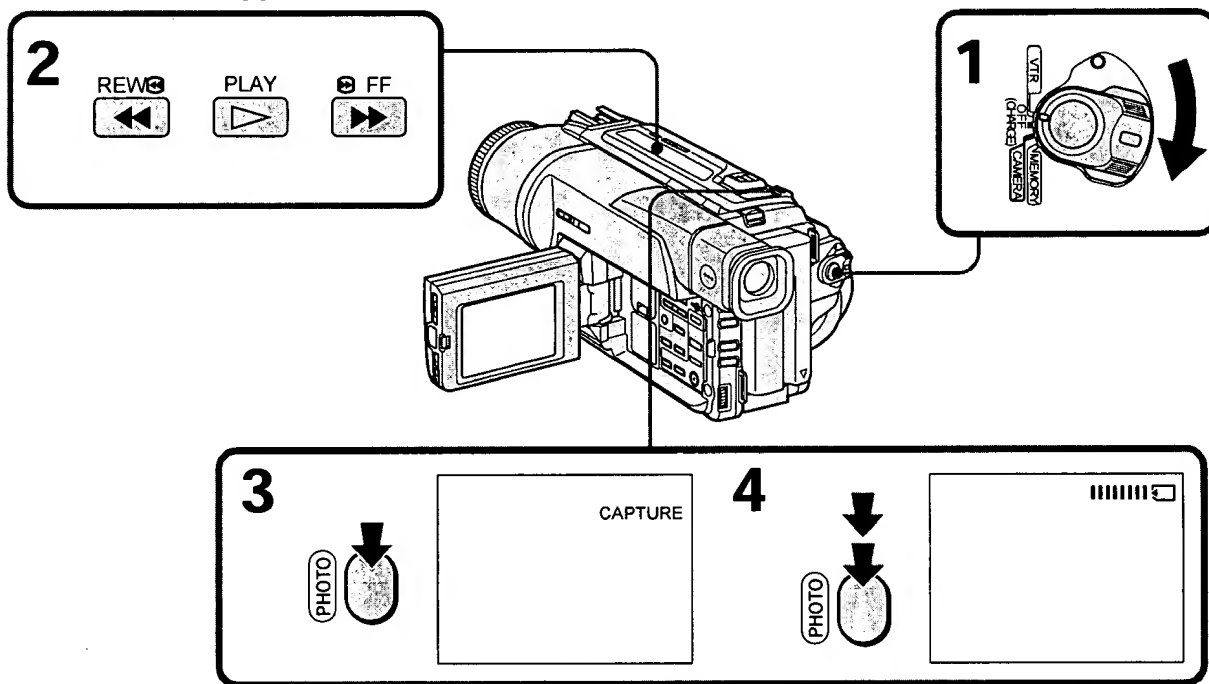
– DCR-TRV320 only

Your camcorder can read moving image data recorded on a tape in the Digital8 **D** system, and record it as a still image on a "Memory Stick". Your camcorder can also take in moving image data through the input connector and record it as a still image on a "Memory Stick".

Before operation

Insert a tape recorded in the Digital8 **D** system and a "Memory Stick" into your camcorder.

- (1) Set the POWER switch to VTR.
- (2) Press **▶**. The image recorded on the tape is played back.
- (3) Keep pressing PHOTO lightly until the picture from the tape freezes. CAPTURE appears on the LCD screen or in the viewfinder. Recording does not start yet.
- (4) Press PHOTO deeper. The image displayed on the screen will be recorded on the "Memory Stick". Recording is complete when the bar scroll indicator disappears.



When the access lamp is lit or flashing

Do not shake or strike the unit. As well do not turn the power off, eject the "Memory Stick" or remove the battery pack. Otherwise, the image data breakdown may occur.

If **3** appears on the LCD screen or in the viewfinder

The inserted "Memory Stick" is incompatible with your camcorder because its format does not conform with your camcorder. Check the format of the "Memory Stick".

If you press PHOTO lightly in the playback mode

Your camcorder stops momentarily.

Sound recorded on a tape

You cannot record the audio from a tape.

Titles superimposed on tapes

You cannot record the titles on the "Memory Stick." However, you can record the titles which have already been recorded on tapes.

When you press PHOTO on the Remote Commander

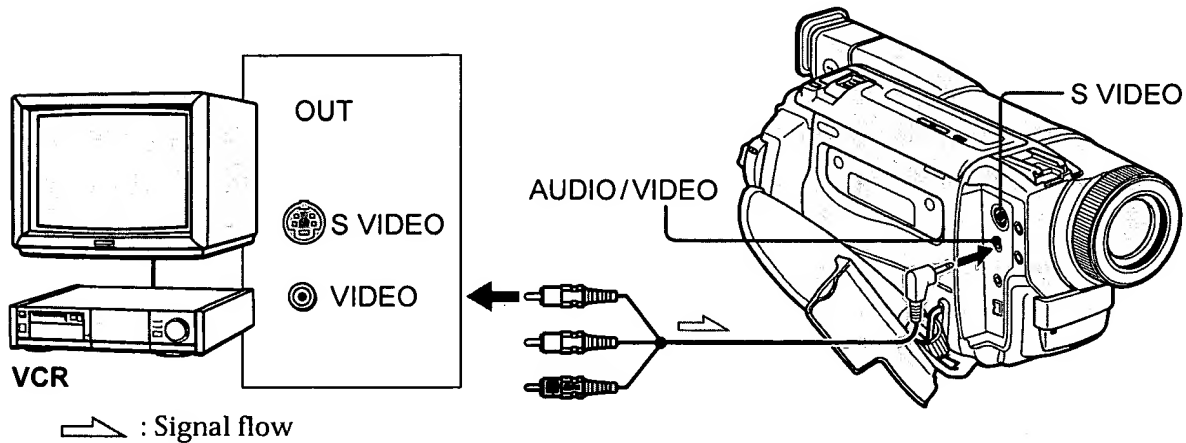
Your camcorder immediately records the image that is on the screen when you press the button.

Recording an image from a tape as a still image

Recording a still image from other equipment

- (1) Set the POWER switch to VTR and set DISPLAY to LCD in the menu settings.
- (2) Play back the recorded tape, or turn the TV on to see the desired program.
The image from a TV or VCR appear on the LCD screen or in the viewfinder.
- (3) Follow the steps 3 and 4 on page 84.

Using the A/V connecting cable

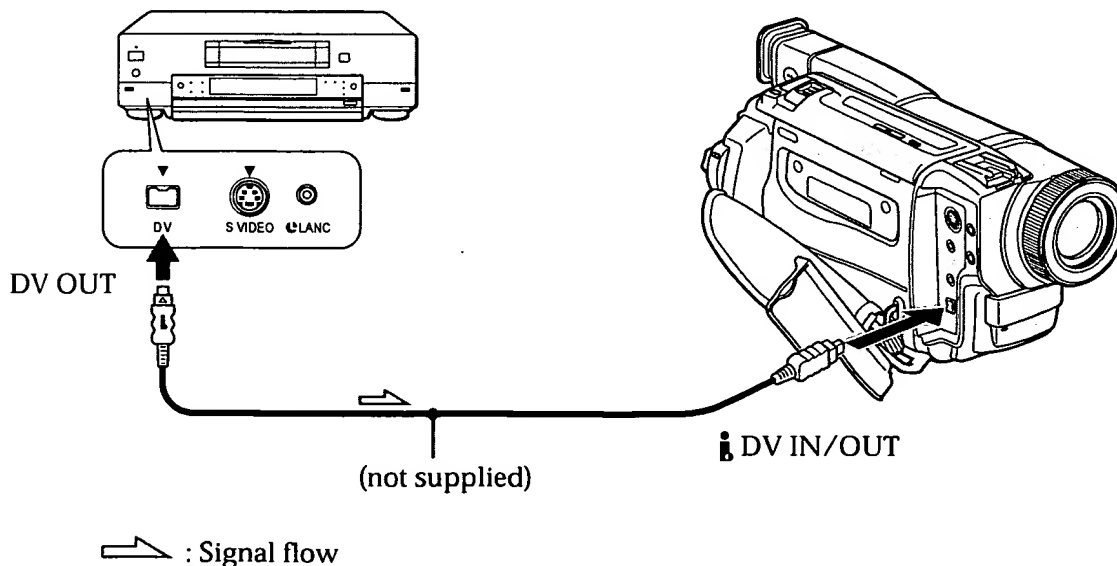


Connect the yellow plug of the A/V connecting cable to the video jack on the VCR or the TV.

If your TV or VCR has an S video jack

Connect using an S video cable (not supplied) to obtain high-quality pictures. With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable. Connect an S video cable (not supplied) to the S video jacks of both your camcorder and the TV or VCR.

Using the i. LINK cable (DV connecting cable)




Copying still images from a tape - Photo save

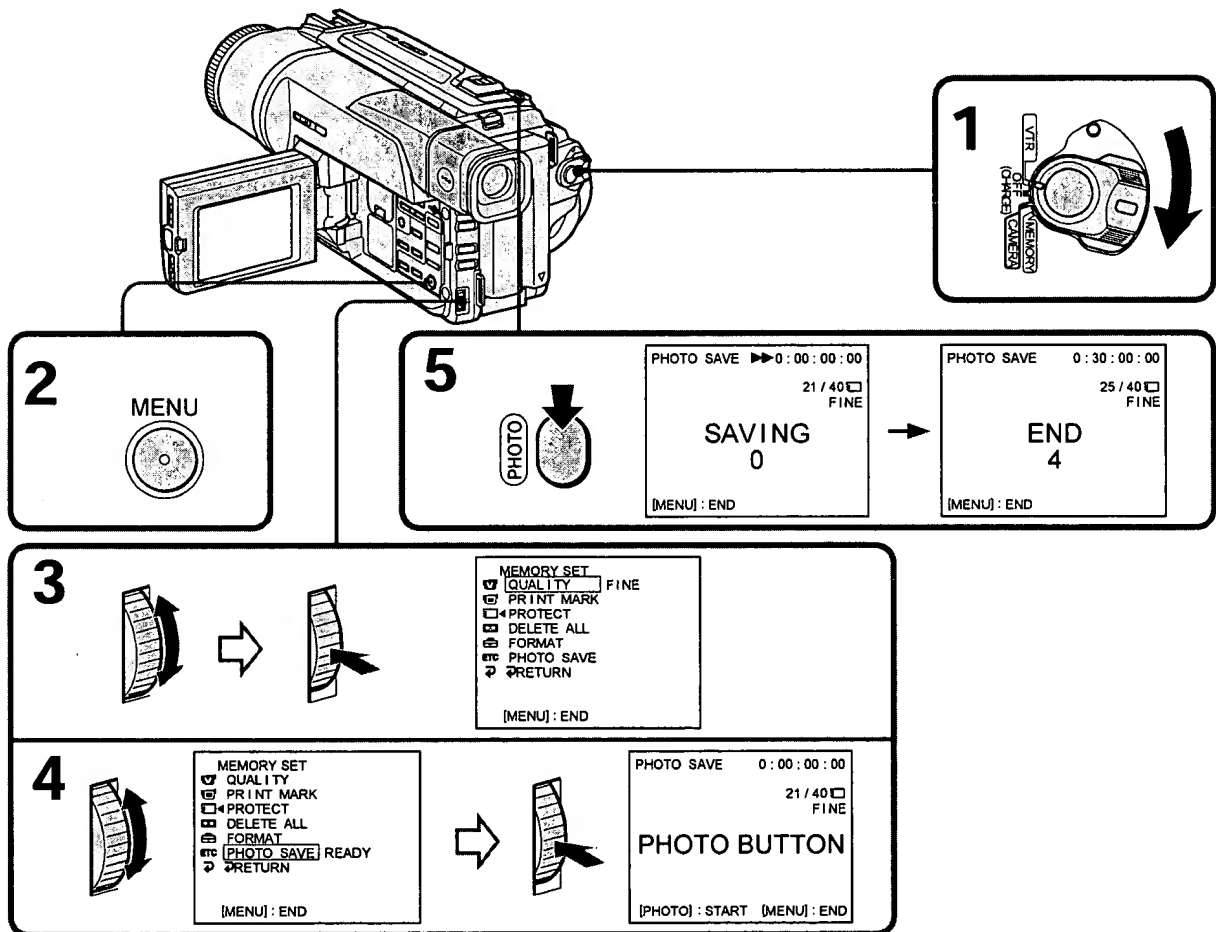
- DCR-TRV320 only

Using the search function, you can automatically take in only still images from tapes recorded in the Digital8 **B** system and record them on a "Memory Stick" in sequence.

Before operation

- Insert a tape recorded in the Digital8 **B** system and rewind the tape.
- Insert a "Memory Stick" into your camcorder.

- (1) Set the POWER switch to VTR.
- (2) Press MENU to make the menu display appear.
- (3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (4) Turn the SEL/PUSH EXEC dial to select PHOTO SAVE, then press the dial.
PHOTO BUTTON appears on the LCD screen or in the viewfinder.
- (5) Press PHOTO firmly. The still image from the tape is recorded on the "Memory Stick". The number of still images copied is displayed. END is displayed when copying is completed.



Copying still images from a tape – Photo save

To stop copying

Press MENU to stop copying.

When the memory of the "Memory Stick" is full

MEMORY FULL appears on the LCD screen, and the copying stops. Insert another "Memory Stick" and repeat the procedure from step 2.

When the access lamp is lit or flashing

Do not shake or strike your camcorder. As well do not turn the power off, eject the "Memory Stick" or remove the battery pack. Otherwise, the image data breakdown may occur.

To record all the images recorded on the tape

Rewind the tape all the way back and start copying.

If the write-protect tab on the "Memory Stick" is set to LOCK

NOT READY appears when you select PHOTO SAVE in the menu settings.

When you change the "Memory Stick" in the middle of copying

Your camcorder resumes copying from the last image recorded on the previous "Memory Stick".

"Memory Stick" operations

Viewing a still image

- Memory Photo playback

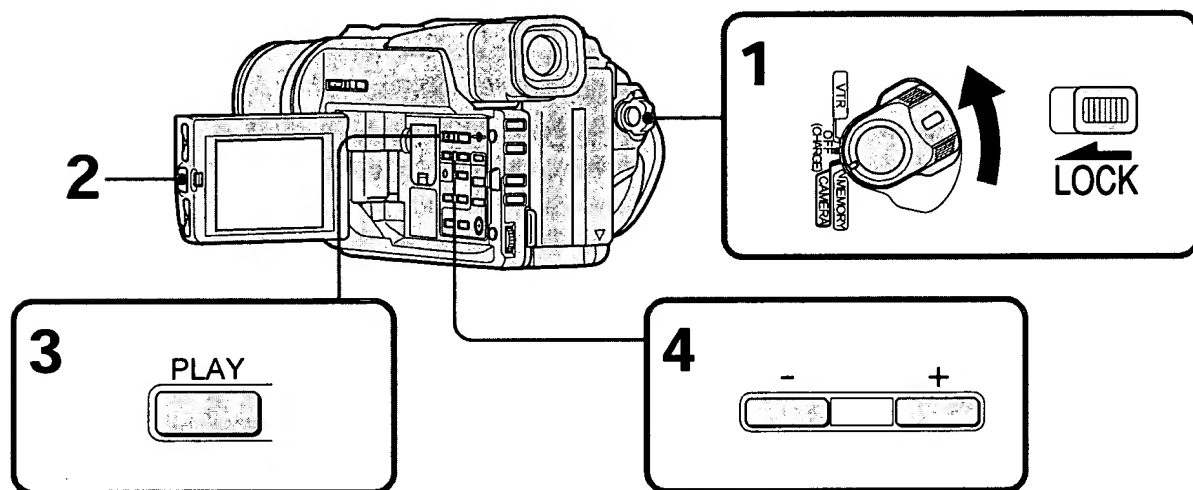
- DCR-TRV320 only

You can play back still images recorded on a "Memory Stick". You can also play back 6 images at a time by selecting the index screen.

Before operation

Insert a "Memory Stick" into your camcorder.

- (1) Set the POWER switch to MEMORY or VTR. Make sure that the LOCK is set to the right (unlock) position.
- (2) Open the LCD panel while pressing OPEN.
- (3) Press MEMORY PLAY. The last recorded image is displayed.
- (4) Press MEMORY +/- to select the desired still image. To see the previous image, press MEMORY -. To see the next image, press MEMORY +.



To stop memory photo playback.

Press MEMORY PLAY.

To play back recorded images on a TV screen

- Connect your camcorder to the TV with the A/V connecting cable supplied with your camcorder before the operation.
- When operating memory photo playback on a TV or the LCD screen, the image quality may appear to have deteriorated. This is not a malfunction. The image data is as good as ever.
- Turn the audio volume of the TV down before operation, or noise (howling) may be output from the TV speakers.

If "NO FILE" appears on the LCD screen or in the viewfinder

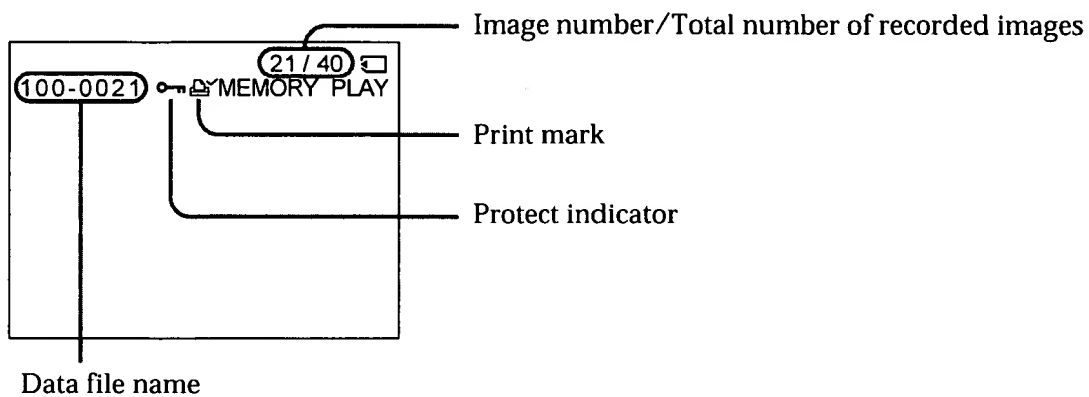
No image is recorded on the "Memory Stick."

Image data modified with personal computers or shot with other equipment

You may not be able to play them back with your camcorder.

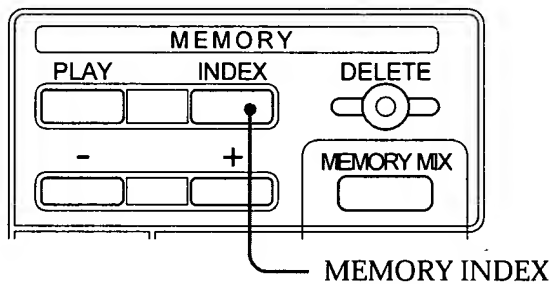
Viewing a still image - Memory Photo playback

Screen indicators during still image playback



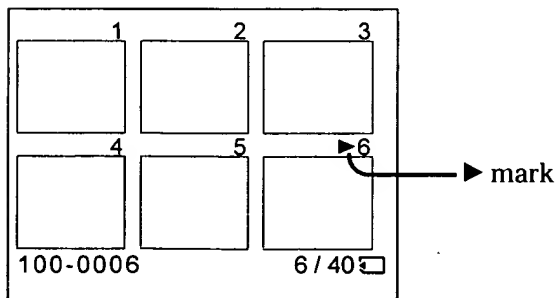
Playing back 6 recorded images at a time (index screen)

You can play back 6 recorded images at a time. This function is especially useful when searching for a particular image.



Press MEMORY INDEX.

A red ► mark appears above the image that is displayed before changing to the index screen mode.



- To display the following 6 images, keep pressing MEMORY +.
- To display the previous 6 images, keep pressing MEMORY -.

To return to the normal playback screen (single screen)

Press MEMORY +/- to move the ► mark to the image you want to display on full screen, then press MEMORY PLAY.

Viewing a still image – Memory Photo playback

Note

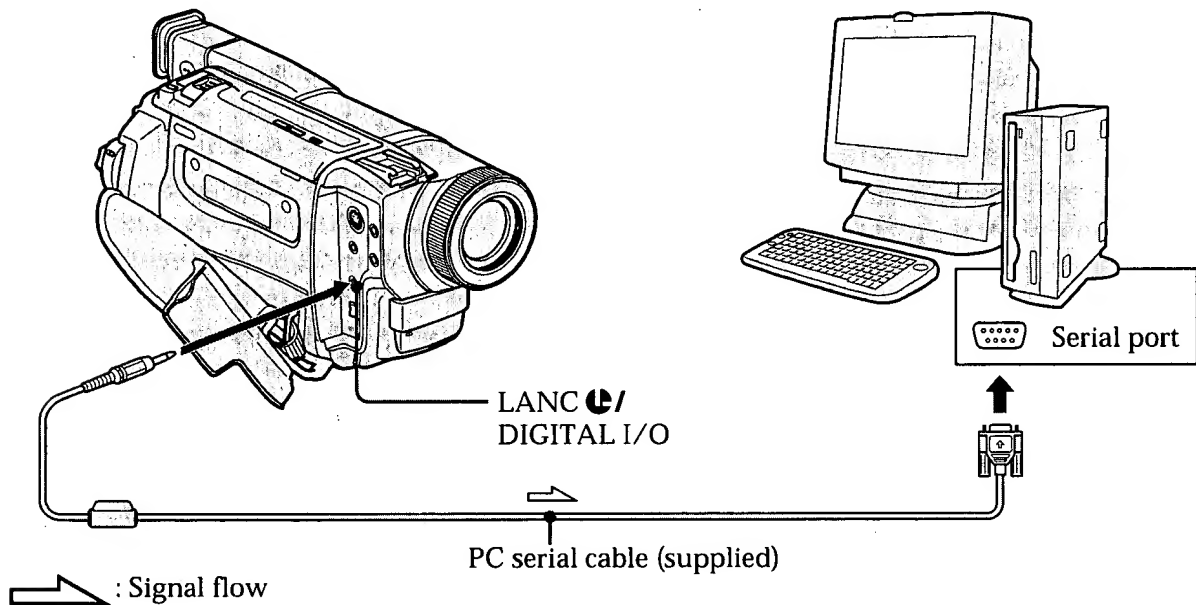
When displaying the index screen, the number appears above each image. This indicates the order in which images are recorded on the “Memory Stick”. These numbers are different from the data file names.

Files modified with personal computers

These files may not be displayed on the index screen. Image files shot with other equipment may not be displayed on the index screen either.

Viewing the recorded images using a personal computer

The image data recorded with your camcorder is compressed in the JPEG format. If you use the application software, PictureGear 4.1Lite supplied with your camcorder, you can see images recorded on the “Memory Stick” on a computer screen. Use the PC serial cable supplied with your camcorder for this operation.



Copying the image recorded on "Memory Stick" to tapes

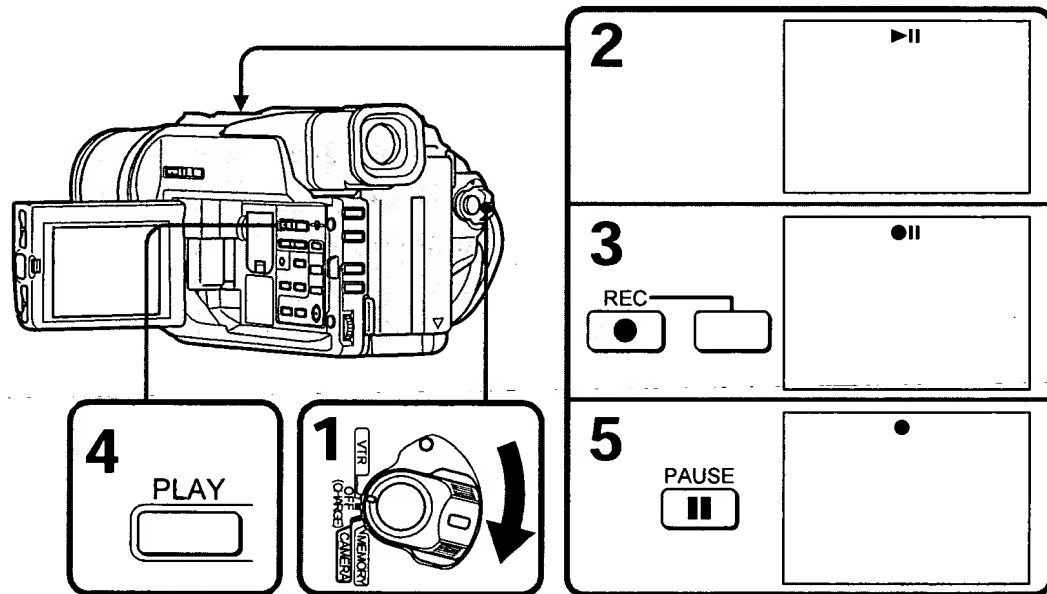
- DCR-TRV320 only

You can copy still images or titles recorded on "Memory Stick"s and record them to Hi8 **Hi8**/Digital8 **D** tapes.

Before operation

Insert a Hi8 **Hi8**/Digital8 **D** tape for recording and a "Memory Stick" into your camcorder.

- (1) Set the POWER switch to VTR.
- (2) Using the video control buttons, search a point where you want to record the desired still image. Set the Hi8 **Hi8**/Digital8 **D** tape to playback pause mode.
- (3) Press ● REC and the button on its right simultaneously on your camcorder.
The Hi8 **Hi8**/Digital8 **D** tape is set to the recording pause mode.
- (4) Press MEMORY PLAY to play back the still image you want to copy (p. 88).
- (5) Press **II** to start recording and press **II** again to stop.
- (6) If you have more to copy, repeat steps 4 and 5.



"Memory Stick" operations

To stop copying in the middle

Press ■.

Copying the image recorded on "Memory Stick" to tapes

During copying

You cannot operate the following buttons:

MEMORY PLAY, MEMORY INDEX, MEMORY DELETE, MEMORY MIX, MEMORY +, and MEMORY -.

Note on the index screen

You cannot record the index screen.

If you press the EDITSEARCH buttons during pause mode

Memory playback stops.

Image data modified with personal computers or shot with other equipment

You may not be able to copy them with your camcorder.

If you press the DISPLAY button in the standby or recording mode

You can see memory playback and the file name indicators in addition to the indicators pertinent to Hi8 **Hi8**/Digital8 **D** tapes, such as the time code indicator.

When copying

You cannot copy the image recorded on "Memory Stick" with titles to tapes.

Enlarging still images recorded on "Memory Stick"s – Memory PB ZOOM

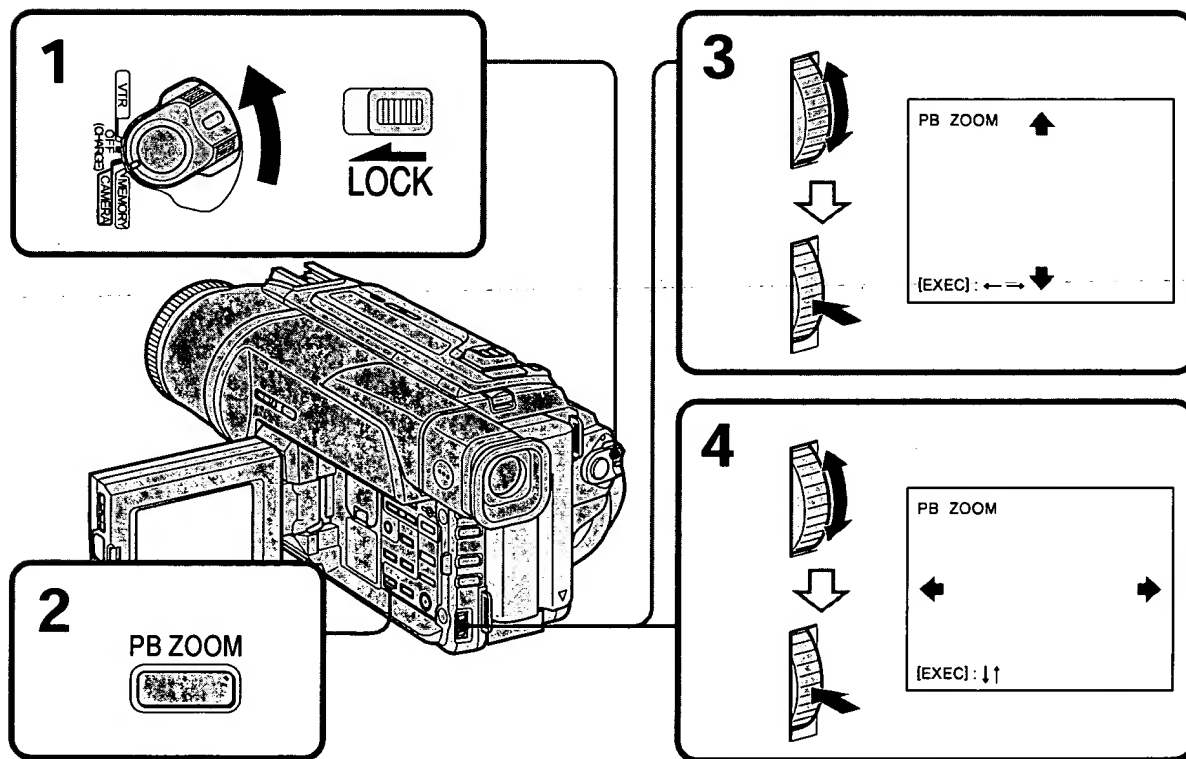
– DCR-TRV320 only

You can enlarge still images recorded on a "Memory Stick".

Before operation

Insert a "Memory Stick" into your camcorder.

- (1) Set the POWER switch to MEMORY or VTR. Make sure that the LOCK is set to the right (unlock) position.
- (2) Press PB ZOOM on your camcorder while you are playing back images recorded on "Memory Stick". The still image is enlarged, and ↑ ↓ appears on the LCD screen or in the viewfinder.
- (3) Turn SEL/PUSH EXEC dial to move the enlarged image, then press the dial.
 - ↑ : The image moves downwards
 - ↓ : The image moves upwards
 - ← → becomes available.
- (4) Turn SEL/PUSH EXEC dial to move the enlarged image, then press the dial.
 - ← : The image moves rightward (Turn the dial downwards.)
 - : The image moves leftward (Turn the dial upwards.)



"Memory Stick" operations

To cancel memory PB ZOOM function

Press PB ZOOM.

Pictures processed by PB ZOOM function

Pictures processed by PB ZOOM function are not output through the i DV IN/OUT jack.


Playing back images in a continuous loop – SLIDE SHOW

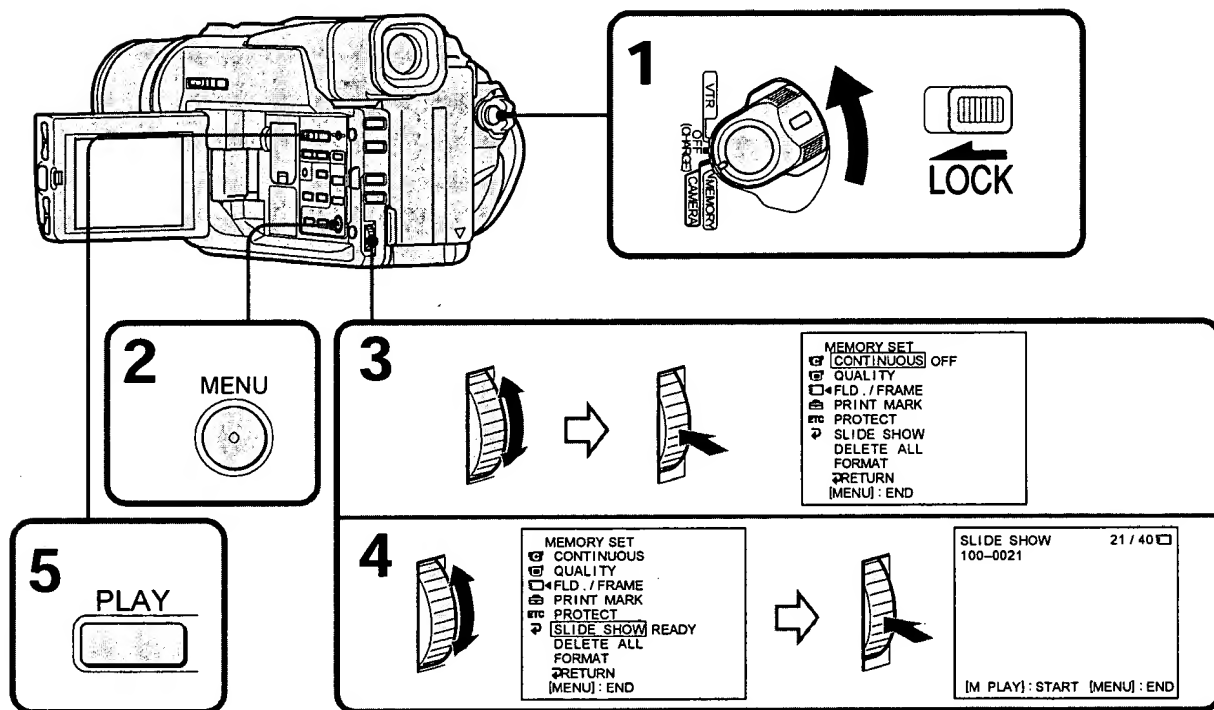
– DCR-TRV320 only

You can automatically play back images in sequence. This function is useful especially when checking recorded images or during a presentation.

Before operation

Insert a "Memory Stick" into your camcorder.

- (1) Set the POWER switch to MEMORY. Make sure that the LOCK is set to the right (unlock) position.
- (2) Press MENU to make the menu display appear.
- (3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (4) Turn the SEL/PUSH EXEC dial to select SLIDE SHOW, then press the dial.
- (5) Press MEMORY PLAY. Your camcorder plays back the images recorded on the "Memory Stick" in sequence.



To stop the slide show

Press MENU.

To pause during a slide show

Press MEMORY PLAY.

To start the slide show from a particular image

Select the desired image using MEMORY +/- buttons before step 2.

Playing back images in a continuous loop – SLIDE SHOW

To view the recorded images on TV

Connect your camcorder to a TV with the A/V connecting cable supplied with your camcorder before operation.

If you change the "Memory Stick" during operation

The slide show does not operate. If you change the "Memory Stick", be sure to follow the steps again from the beginning.



Preventing accidental erasure – Image protection

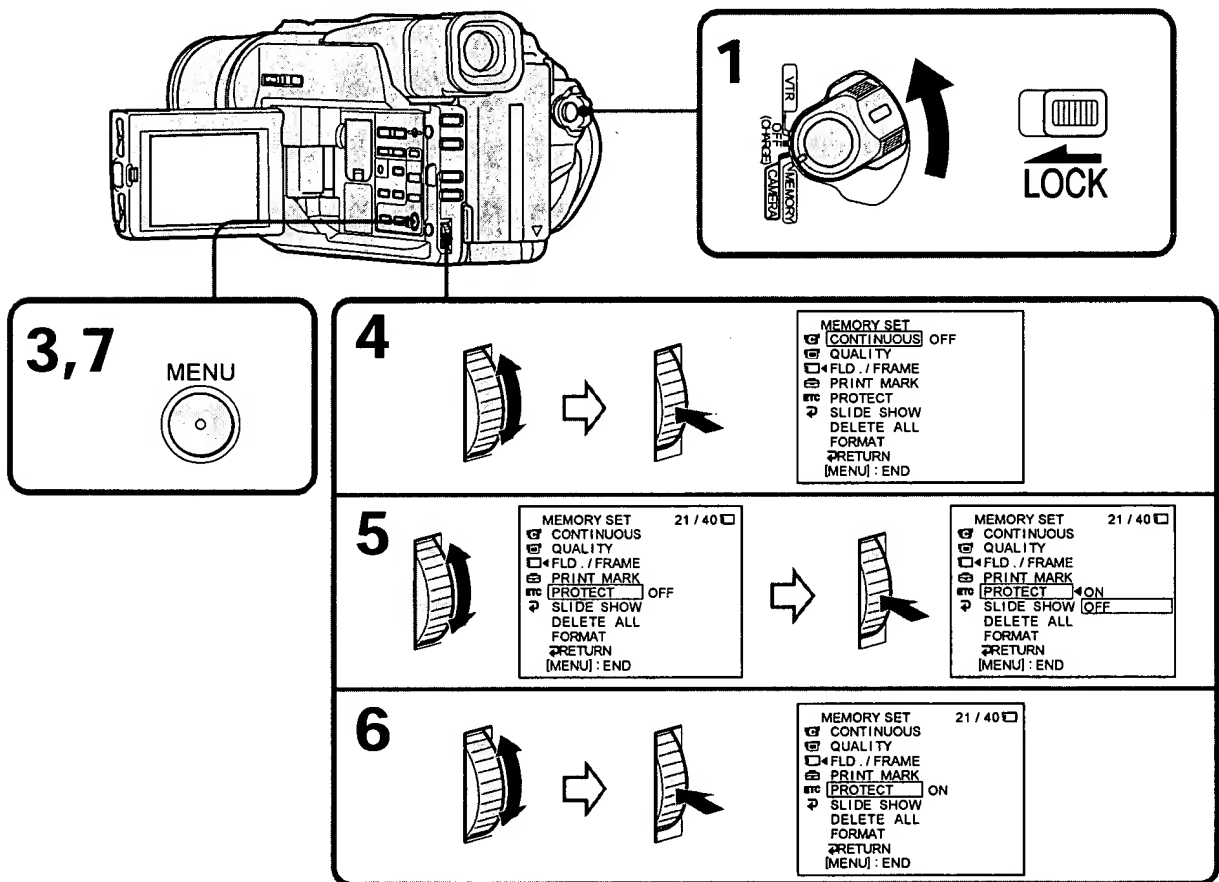
– DCR-TRV320 only

To prevent accidental erasure of important images, you can protect selected images.

Before operation

Insert a “Memory Stick” into your camcorder.

- (1) Set the POWER switch to MEMORY or VTR. Make sure that the LOCK is set to the right (unlock) position.
- (2) Play back the image you want to protect (p. 88).
- (3) Press MENU to make the menu display appear.
- (4) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (5) Turn the SEL/PUSH EXEC dial to select PROTECT, then press the dial.
- (6) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
- (7) Press MENU to erase the menu display. The  mark is displayed beside the data file name of the protected image.



To cancel image protection

Select OFF in step 6, then press the SEL/PUSH EXEC dial.

Note

Formatting erases all information on the “Memory Stick”, including the protected image data. Check the contents of the “Memory Stick” before formatting.

If the write-protect tab on the “Memory Stick” is set to LOCK
You cannot carry out image protection.

Deleting images

– DCR-TRV320 only

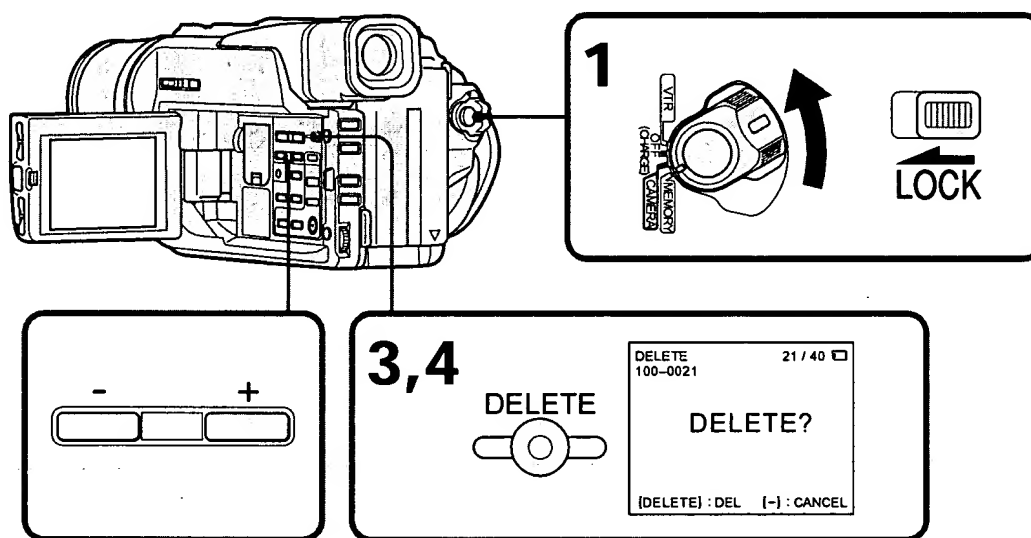
You can delete images stored in a “Memory Stick”.

Before operation

Insert a “Memory Stick” into your camcorder.

Deleting selected images

- (1) Set the POWER switch to MEMORY or VTR. Make sure that the LOCK is set to the right (unlock) position.
- (2) Play back the image you want to delete (p. 88).
- (3) Press MEMORY DELETE. “DELETE?” appears on the LCD screen.
- (4) Press MEMORY DELETE again. The selected image is deleted.



“Memory Stick” operations

To cancel deleting an image

Press MEMORY – in step 4.

To delete an image displayed on the index screen

Press MEMORY +/- to move the ► indicator to the desired image and follow steps 3 and 4.


Notes

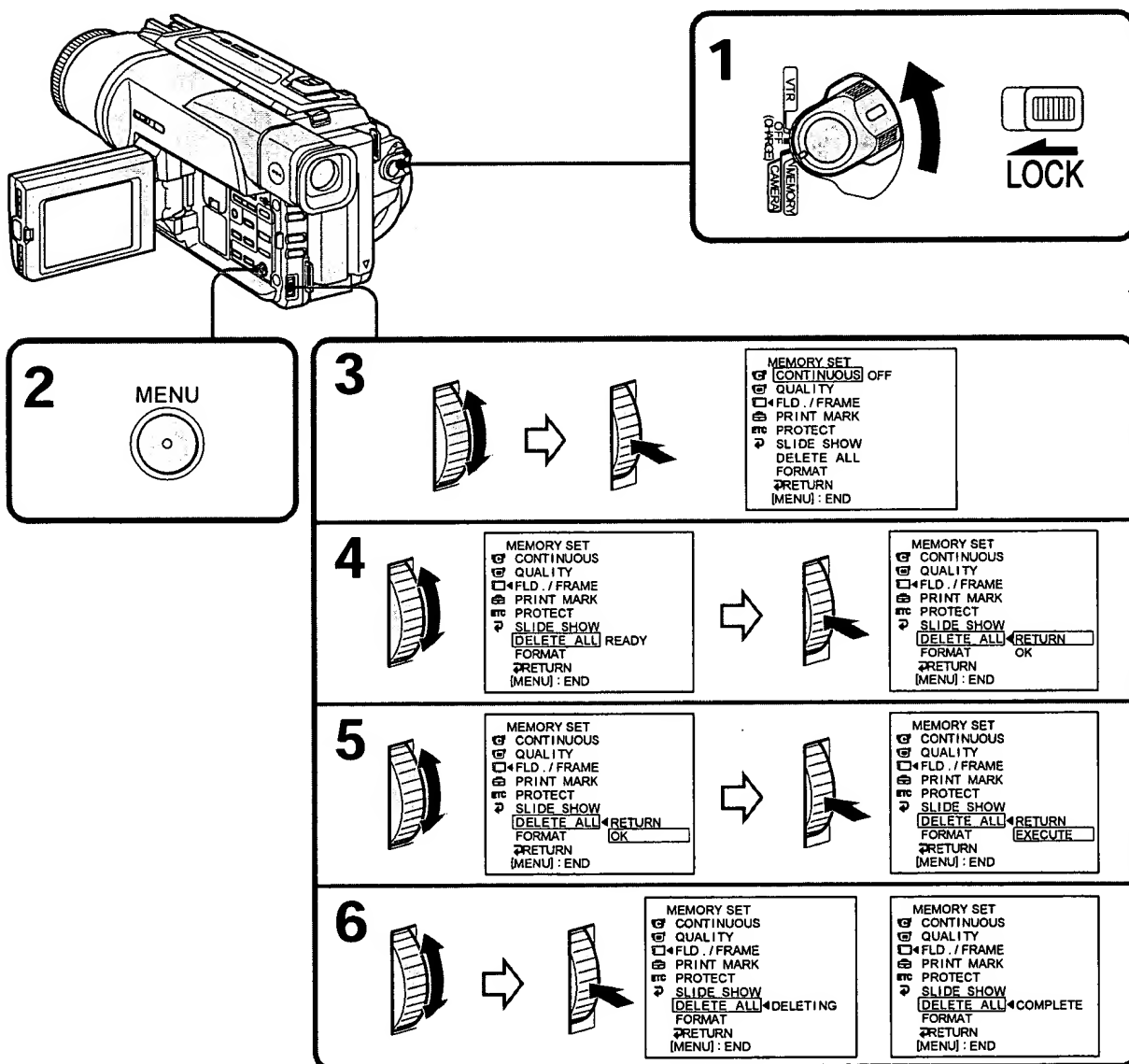
- To delete a protected image, first cancel image protection.
- Once you delete an image, you cannot restore it. Check the images to delete carefully before deleting them.

Deleting images

Deleting all the images

You can delete all the unprotected images in the "Memory Stick".

- (1) Set the POWER switch to MEMORY or VTR. Make sure that the LOCK is set to the right (unlock) position.
- (2) Press MENU to make the menu display appear.
- (3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (4) Turn the SEL/PUSH EXEC dial to select DELETE ALL, then press the dial.
- (5) Turn the SEL/PUSH EXEC dial to select OK, then press the dial. OK changes to EXECUTE.
- (6) Turn the SEL/PUSH EXEC dial to select EXECUTE, then press the dial. DELETING appears on the LCD screen. When all the unprotected images are deleted, COMPLETE is displayed.



To cancel deleting all the images in the "Memory Stick"
Select RETURN in step 5, then press the SEL/PUSH EXEC.

Deleting images

While **DELETING** appears

Do not turn the **POWER** switch or press any buttons.

If the write-protect tab on the "Memory Stick" is set to **LOCK**

You cannot delete images.

"Memory Stick" operations

Writing a print mark – PRINT MARK



– DCR-TRV320 only

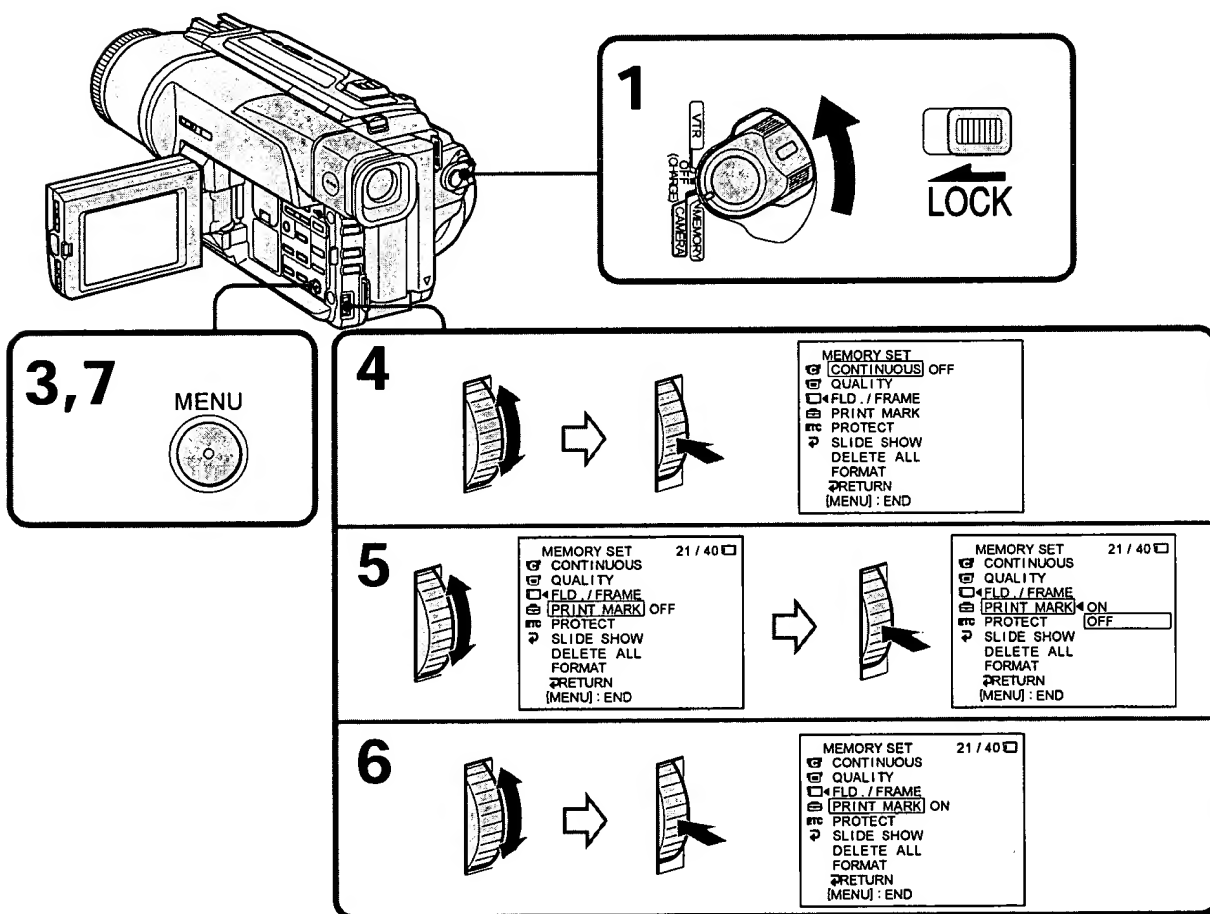
You can specify the recorded still image to print out. This function is useful for printing out still images later.

Your camcorder conforms with the DPOF (Digital Print Order Format) standard for specifying the still images to print out.

Before operation

Insert a "Memory Stick" into your camcorder.

- (1) Set the POWER switch to MEMORY or VTR. Make sure that the LOCK is set to the right (unlock) position.
- (2) Play back the image you want to write a print mark (p. 88).
- (3) Press MENU to display the menu.
- (4) Turn the SEL/PUSH EXEC dial to select , then press the dial.
- (5) Turn the SEL/PUSH EXEC dial to select PRINT MARK, then press the dial.
- (6) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
- (7) Press MENU to erase the menu display. The  mark is displayed beside the data file name of the image with a print mark.





To cancel writing print marks

Select OFF in step 6, then press the SEL/PUSH EXEC dial.

If the write-protect tab on the "Memory Stick" is set to LOCK
You cannot write print marks on still images.






Digital8 system, recording and playback



What is the "Digital8 system"?

This video system has been developed to enable digital recording to Hi8 /Digital8  video cassette.




Usable cassette tapes

We recommend using Hi8 /Digital8  video cassette.*


The recording time when you use your Digital8  system camcorder on Hi8 /standard 8  tape is half the recording time when using the conventional Hi8 /standard 8  system camcorder. (120 minutes of recording time becomes 60 minutes in the SP mode.)

* If you use standard 8  tape, be sure to play back the tape on this camcorder. Mosaic pattern noise may appear when you play back standard 8  tape on other VCRs (including other DCR-TRV120/TRV320).

Note




Tapes recorded in the Digital8  system cannot be played back on Hi8 /standard 8  (analog) system machine.

 is a trademark.

 is a trademark.




 is a trademark.







Playback system

The Digital8  system or Hi8 /standard 8  system is automatically detected before the tape is played back.

During playback of tapes recorded in the Hi8 /standard 8  system, digital signals are output as the image signals from the  DV IN/OUT jack.

Display during automatic detection of system

The Digital8  system or Hi8 /standard 8  system is automatically detected, and the playback system is automatically switched to. During switching of systems, the screen turns blue, and the following displays appear. A hissing noise also sometimes can be heard.

 → /: During switching from Digital8  to Hi8 /standard 8 

/ → : During switching from Hi8 /standard 8  to Digital8 

Copyright signal

When you play back

Using any other video camera recorder, you cannot record on a tape that has recorded copyright control signals for copyright protection of software which is played back on your camcorder.

When you record


You cannot record software on your camcorder that contains copyright control signals for copyright protection of software.

COPY INHIBIT appears on the LCD screen, in the viewfinder or on the TV screen if you try to record such software. Your camcorder does not record copyright control signals on the tape when it records.

Digital8 system, recording and playback

When you playback a dual sound track tape

When you use tapes recorded in the Digital8 system

When you play back a Digital8  system tape which is dubbed from a dual sound track tape recorded in the DV system, set HiFi SOUND to the desired mode in the menu settings (p. 63).

Sound from speaker

HiFi Sound Mode	Playing back a stereo tape	Playing back a dual sound track tape
STEREO	Stereo	Main sound and sub sound
1	Lch	Main sound
2	Rch	Sub sound

When you use a tape recorded in the Hi8/standard 8 system

When you play back a dual sound track tape recorded in an AFM HiFi stereo system, set HiFi SOUND to the desired mode in the menu settings (p. 63).

Sound from speaker

HiFi Sound Mode	Playing back a stereo tape	Playing back a dual sound track tape
STEREO	Stereo	Main sound and sub sound
1	Monaural	Main sound
2	Unnatural Sound	Sub sound

You cannot record dual sound programs on your camcorder.

About i.LINK

The DV jack on this unit is an i.LINK-compliant DV input/output jack. This section describes the i.LINK standard and its features.

What is "i.LINK"?

i.LINK is a digital serial interface for handling digital video, digital audio and other data in two directions between equipment having the i.LINK jack, and for controlling other equipment.

i.LINK-compatible equipment can be connected by a single i.LINK cable. Possible applications are operations and data transactions with various digital AV equipment. When two or more i.LINK-compatible equipment are connected to this unit in a daisy chain, operations and data transactions are possible with not only the equipment that this unit is connected to but also with other devices via the directly connected equipment.

Note, however, that the method of operation sometimes varies according to the characteristics and specifications of the equipment to be connected, and that operations and data transactions are sometimes not possible on some connected equipment.

Note

Normally, only one piece of equipment can be connected to this unit by the i.LINK cable (DV cable). When connecting this unit to i.LINK-compatible equipment having two or more i.LINK jacks (DV jacks), refer to the instruction manual of the equipment to be connected.

About the Name "i.LINK"

i.LINK is a more familiar term for IEEE 1394 data transport bus proposed by SONY, and is a trademark approved by many corporations. IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronic Engineers.

i.LINK Baud rate

i.LINK's maximum baud rate varies according to the equipment. Three maximum baud rates are defined:

S100 (approx. 100Mbps*)

S200 (approx. 200Mbps)

S400 (approx. 400Mbps)

The baud rate is listed under "Specifications" in the instruction manual of each equipment. It is also indicated near the i.LINK jack on some equipment.

The maximum baud rate of equipment on which it is not indicated such as this unit is "S100".

When units are connected to equipment having a different maximum baud rate, the baud rate sometimes differs from the indicated baud rate.

* What is "Mbps"?

Mbps stands for megabits per second, or the amount of data that can be sent or received in one second. For example, a baud rate of 100Mbps means that 100 megabits of data can be sent in one second.

About i.LINK

i.LINK Functions on this unit

For details on how to dub when this unit is connected to other video equipment having DV jacks, see page 57.


This unit can also be connected to other i.LINK (DV) compatible equipment made by SONY (e.g. VAIO series personal computer) other than video equipment.

Before connecting this unit to a personal computer, make sure that application software supported by this unit is already installed on the personal computer.

For details on precautions when connecting this unit, also refer to the instruction manuals for the equipment to be connected.


Required i.LINK Cable

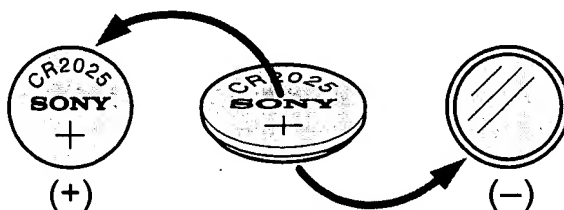
Use the Sony i.LINK 4-pin-to-4-pin cable (during DV dubbing).

i.LINK and  are trademarks.

Changing the lithium battery in your camcorder

When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to reset the date, time and other items in the menu settings hold in memory by the lithium battery.

Insert the battery with the positive (+) side facing out. When the battery becomes weak or dead, the  indicator flashes on the LCD screen or in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA or MEMORY (DCR-TRV320 only). In this case, replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of any other battery may present a risk of fire or explosion. Discard used batteries according to the manufacturer's instructions.



WARNING

The battery may explode if mistreated. Do not recharge, disassemble, nor dispose of it in fire.

Lithium battery

- Keep the lithium battery out of the reach of children.
- Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to ensure good contact.

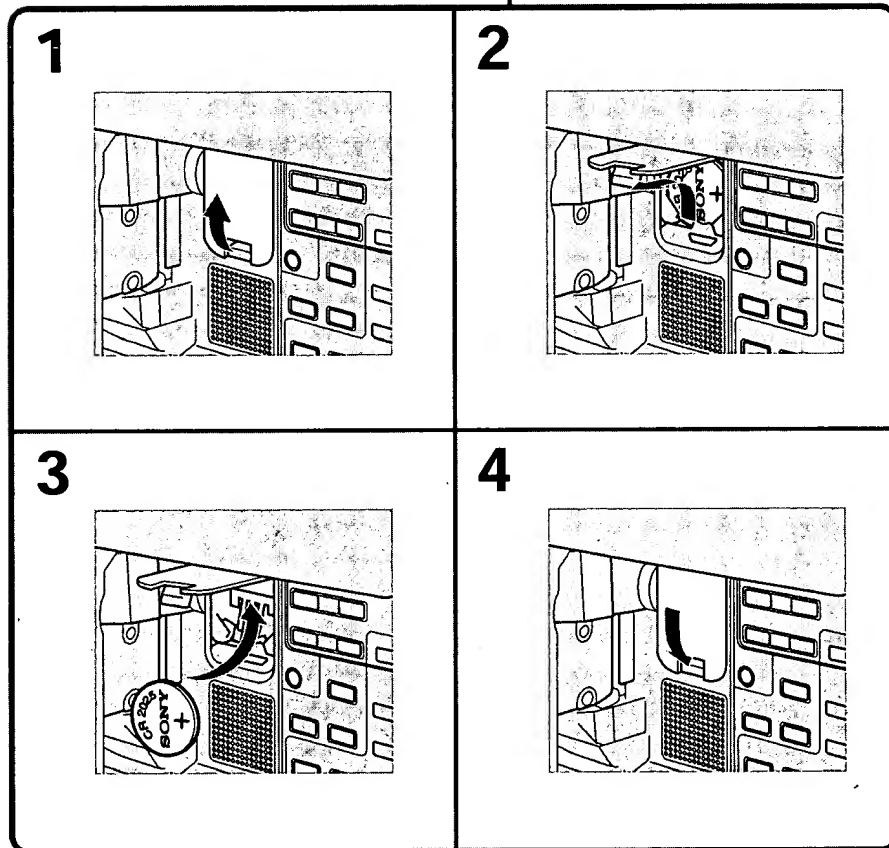
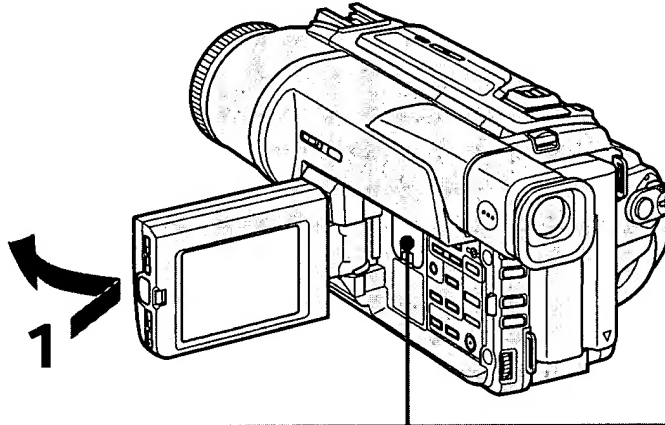
Lithium battery installed at the factory

This battery may not last 1 year.

Changing the lithium battery in your camcorder

Changing the lithium battery

- (1) Open the LCD panel and open the lid of the lithium battery compartment.
- (2) Push the lithium battery up once and pull it out from the holder.
- (3) Install a Sony CR2025 or Duracell DL-2025 lithium battery with the positive (+) side facing out.
- (4) Close the lid.



Troubleshooting

If you run into any problem using your camcorder, use the following table to troubleshoot the problem. If the problem persists, disconnect the power source and contact your Sony dealer or local authorized Sony service facility. If "C:□□:□□" appears on the LCD screen, in the viewfinder or the display window, the self-diagnosis display function has worked. See page 112.

In the recording mode

Symptom	Cause and/or Corrective Actions
START/STOP does not operate.	<ul style="list-style-type: none"> The POWER switch is set to OFF (CHARGE), VTR or MEMORY (DCR-TRV320 only). → Set it to CAMERA. (p. 15) The tape has run out. → Rewind the tape or insert a new one. (p. 14, 23) The write-protect tab is set to expose the red mark. → Use a new tape or slide the tab. (p. 14) The tape is stuck to the drum (moisture condensation). → Remove the cassette and leave your camcorder for at least 1 hour to acclimatize. (p. 116)
The power goes off.	<ul style="list-style-type: none"> While being operated in CAMERA mode, your camcorder has been in the standby mode for more than 3 minutes. → Set the POWER switch to OFF (CHARGE) and then to CAMERA again. (p. 15)
The image on the viewfinder screen is not clear.	<ul style="list-style-type: none"> The viewfinder lens is not adjusted. → Adjust the viewfinder lens. (p. 18)
The SteadyShot function does not work.	<ul style="list-style-type: none"> STEADYSHOT is set to OFF in the menu settings. → Set it to ON. (p. 63) 16:9 WIDE is set to ON in the menu settings. → Set it to OFF. (p. 63)
The autofocus function does not work.	<ul style="list-style-type: none"> FOCUS is set to MANUAL. → Set it to AUTO. (p. 42) Shooting conditions are not suitable for autofocus. → Set FOCUS to MANUAL to focus manually. (p. 42)
The fader function does not work.	<ul style="list-style-type: none"> The digital effect function is working. → Cancel it. (p. 36)
The picture does not appear in the viewfinder.	<ul style="list-style-type: none"> The LCD panel is open. → Close the LCD panel. (p. 16)
You cannot record in the LP mode.	<ul style="list-style-type: none"> The tape is the standard 8 tape. → Use Hi8 Hi8/Digital8 D tapes. (p. 67)






Additional Information

(Continued on the following page)

Troubleshooting



Symptom	Cause and/or Corrective Actions
A vertical band appears when you shoot a subject such as lights or a candle flame against a dark background.	<ul style="list-style-type: none"> The contrast between the subject and background is too high. This is not a malfunction.
A vertical band appears when you shoot a very bright subject.	<ul style="list-style-type: none"> This is not a malfunction.
Some tiny white spots appear on the LCD screen or in the viewfinder.	<ul style="list-style-type: none"> Slow shutter, low lux or Super NightShot mode is activated. This is not a malfunction.
An unknown picture is displayed on the LCD screen or in the viewfinder.	<ul style="list-style-type: none"> If 10 minutes elapse after you set the POWER switch to CAMERA or DEMO MODE is set to ON in the menu settings without a cassette inserted, your camcorder automatically starts the demonstration. <ul style="list-style-type: none"> → Insert a cassette and the demonstration stops. You can also cancel DEMO MODE. (p. 68)
The picture is recorded in incorrect or unnatural colors.	<ul style="list-style-type: none"> NIGHTSHOT is set to ON. <ul style="list-style-type: none"> → Set it to OFF. (p. 19)
Picture appears too bright, and the subject does not appear on the LCD screen or in the viewfinder.	<ul style="list-style-type: none"> NIGHTSHOT is set to ON in a bright place. <ul style="list-style-type: none"> → Set it to OFF, or use the NightShot function in a dark place. (p. 19)
A horizontal black band appears when shooting a TV screen or computer screen.	<ul style="list-style-type: none"> Set STEADYSHOT to OFF in the menu settings. (P. 63)

In the playback mode

Symptom	Cause and/or Corrective Actions
The tape does not move when a video control button is pressed.	<ul style="list-style-type: none"> The POWER switch is set to CAMERA, MEMORY (DCR-TRV320 only) or OFF (CHARGE). <ul style="list-style-type: none"> → Set it to VTR. (p. 23)
The playback button does not work.	<ul style="list-style-type: none"> The tape has run out. <ul style="list-style-type: none"> → Rewind the tape. (p. 23)
There are horizontal lines on the picture or the playback picture is not clear or does not appear.	<ul style="list-style-type: none"> The video head may be dirty. <ul style="list-style-type: none"> → Clean the heads using the Sony V8-25CLD cleaning cassette (not supplied). (p. 117)
No sound or only a low sound is heard when playing back a tape.	<ul style="list-style-type: none"> The stereo tape is played back with HiFi SOUND set to 2 in the menu settings. <ul style="list-style-type: none"> → Set it to STEREO. (p. 63) The volume is turned to minimum. <ul style="list-style-type: none"> → Open the LCD panel and press VOLUME +. (p. 23) AUDIO MIX is set to ST2 side in the menu settings. <ul style="list-style-type: none"> → Adjust AUDIO MIX. (p. 63)
The date search does not work correctly.	<ul style="list-style-type: none"> The tape has a blank portion in the recorded portion (p. 52)
The picture which is recorded in the Digital8  system is not played back.	<ul style="list-style-type: none"> PB MODE is set to / in the menu settings. <ul style="list-style-type: none"> → Set it to AUTO. (p. 63)
The tape which is recorded in the Hi8 /standard 8 system is not played back correctly.	<ul style="list-style-type: none"> Set PB MODE to / in the menu settings. (p. 63)

Troubleshooting

In the recording and playback modes

Symptom	Cause and/or Corrective Actions
The power does not turn on.	<ul style="list-style-type: none"> • The battery pack is not installed, or is dead or nearly dead. → Install a charged battery pack. (p. 9, 10) • The AC power adaptor is not connected to a wall outlet. → Connect the AC power adaptor to a wall outlet. (p. 13)
The end search function does not work.	<ul style="list-style-type: none"> • The tape was ejected after recording. • You have not recorded on the new cassette yet.
The end search function does not work correctly.	<ul style="list-style-type: none"> • The tape has a blank portion in the beginning or middle.
The battery pack is quickly discharged.	<ul style="list-style-type: none"> • The operating temperature is too low. • The battery pack is not fully charged. → Charge the battery pack fully again. (p. 10) • The battery pack is completely dead, and cannot be recharged. → Replace with a new battery pack. (p. 9)
The battery remaining indicator does not indicate the correct time.	<ul style="list-style-type: none"> • You have used the battery pack in an extremely hot or cold environment for a long time. • The battery pack is completely dead, and cannot be recharged. → Replace with a new battery pack. (p. 9) • The battery is dead. → Use a charged battery pack. (p. 9, 10)
The power goes off although the battery remaining indicator indicates that the battery pack has enough power to operate.	<ul style="list-style-type: none"> • Charge the battery pack fully again so that the indication on the battery remaining indicator is correct.
The cassette cannot be removed from the holder.	<ul style="list-style-type: none"> • The power source is disconnected. → Connect it firmly. (p. 10, 13) • The battery is dead. → Use a charged battery pack. (p. 9, 10)
The  and  indicators flash and no functions except for cassette ejection work.	<ul style="list-style-type: none"> • Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least 1 hour to acclimatize. (p. 116)

Troubleshooting

When operating using the "Memory Stick"

- DCR-TRV320 only

Symptom	Cause and/or Corrective Actions
The "Memory Stick" does not function.	<ul style="list-style-type: none">• The POWER switch is set to CAMERA or OFF (CHARGE). → Set it to MEMORY. (p. 76)• The "Memory Stick" is not inserted. → Insert a "Memory Stick". (p. 73)
Recording does not function.	<ul style="list-style-type: none">• The "Memory Stick" has already been recorded to its full capacity. → Erase unnecessary images and record again. (p. 76, 97)• The "Memory Stick" formatted incorrectly is inserted. → Format the "Memory Stick" on your camcorder or use another "Memory Stick".• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock. (p. 71)
The image cannot be deleted.	<ul style="list-style-type: none">• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock. (p. 71)• The image is protected. → Cancel image protection. (p. 96)
You cannot format the "Memory Stick".	<ul style="list-style-type: none">• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock. (p. 71)
Deleting all the images cannot be carried out.	<ul style="list-style-type: none">• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock. (p. 71)
You cannot protect the image.	<ul style="list-style-type: none">• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock. (p. 71)• The image to protect is not played back. → Press MEMORY PLAY to play back the image. (p. 88)
You cannot write a print mark on the still image.	<ul style="list-style-type: none">• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock. (p. 71)• The image to write a print mark is not played back. → Press MEMORY PLAY to play back the image. (p. 88)
The photo save function does not work.	<ul style="list-style-type: none">• The write-protect tab on the "Memory Stick" is set to LOCK. → Release the lock. (p. 71)

Troubleshooting

Others

Symptom	Cause and/or Corrective Actions
The Remote Commander supplied with your camcorder does not work.	<ul style="list-style-type: none">• COMMANDER is set to OFF in the menu settings. → Set it to ON. (p. 63)• Something is blocking the infrared rays. → Remove the obstacle.• The batteries are inserted in the battery holder with the + - polarities incorrectly matching the + - marks. → Insert the batteries with the correct polarity. (p. 127)• The batteries are dead. → Insert new ones. (p. 127)
The picture from a TV or VCR does not appear even when your camcorder is connected to outputs on the TV or VCR.	<ul style="list-style-type: none">• DISPLAY is set to V-OUT/LCD in the menu settings. → Set it to LCD. (p. 63)
The melody or beep sounds for 5 seconds.	<ul style="list-style-type: none">• Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least 1 hour to acclimatize. (p. 116)• Some troubles has occurred in your camcorder. → Remove the cassette and insert it again, then operate your camcorder.
While charging the battery pack, no indicator appears or the indicator flashes in the display window.	<ul style="list-style-type: none">• The AC power adaptor is disconnected. → Connect it firmly. (p. 13)• Something is wrong with the battery pack. → Contact your Sony dealer or local authorized Sony service facility.

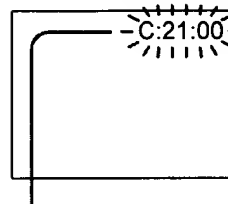
Self-diagnosis display

Your camcorder has a self-diagnosis display function.

This function displays the current condition of your camcorder as a 5-digit code (a combination of a letter and figures) on the LCD screen, in the viewfinder, or in the display window.

If a 5-digit code is displayed, check the following code chart. The last two digits (indicated by □□) will differ depending on the state of your camcorder.

LCD screen, viewfinder or display window



Self-diagnosis display

- C:□□:□□
You can service your camcorder yourself.
- E:□□:□□
Contact your Sony dealer or local authorized Sony facility.

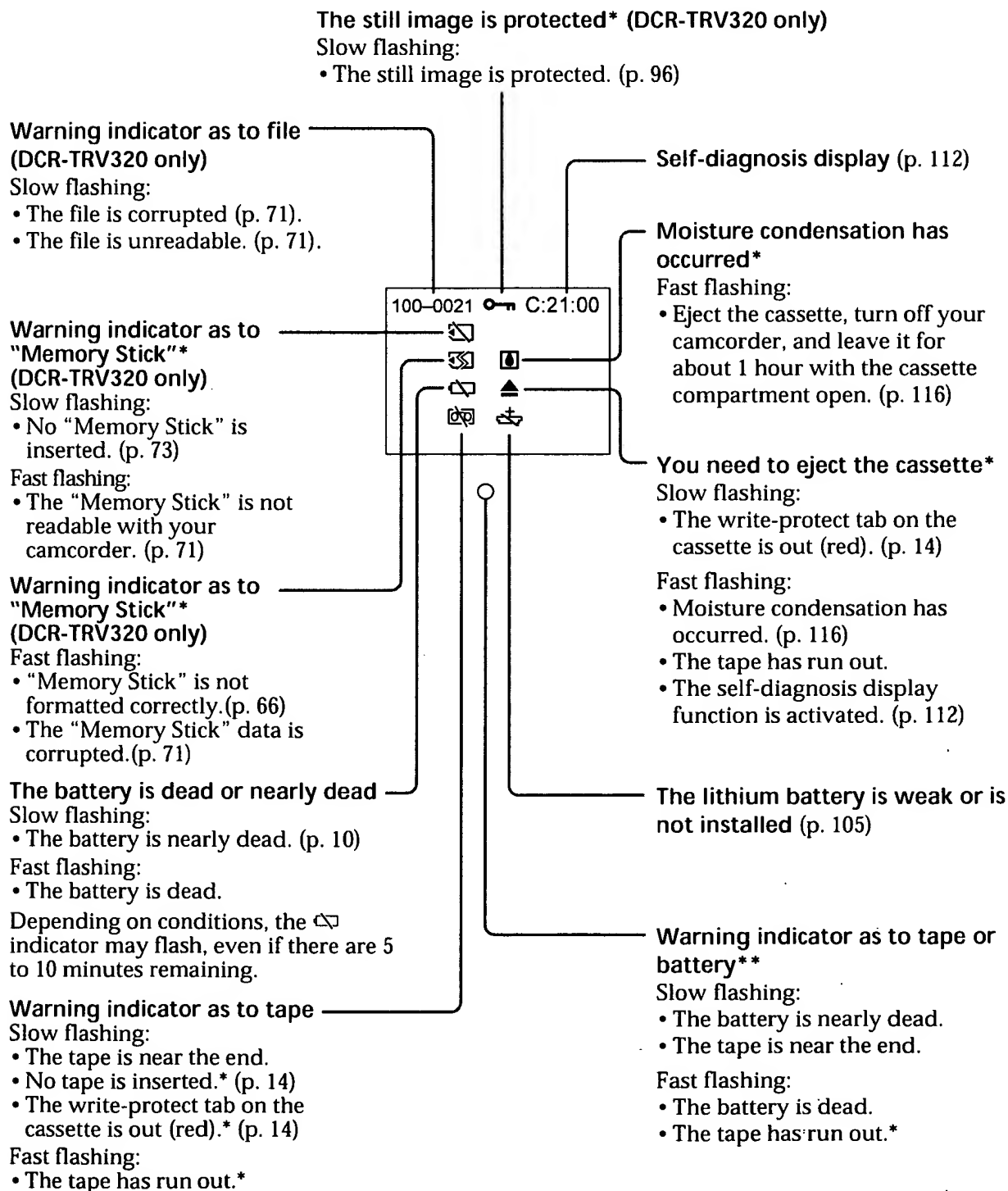
Five-digit display	Cause and/or Corrective Actions
C:04:□□	<ul style="list-style-type: none"> You are using a battery pack that is not an "InfoLITHIUM" battery pack. → Use an "InfoLITHIUM" battery pack. (p. 12)
C:21:□□	<ul style="list-style-type: none"> Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least 1 hour to acclimatize. (p. 116)
C:22:□□	<ul style="list-style-type: none"> The video heads are dirty. → Clean the heads using the Sony V8-25CLD cleaning cassette (not supplied). (p. 117)
C:31:□□ C:32:□□	<ul style="list-style-type: none"> A malfunction other than the above that you can service has occurred. → Remove the cassette and insert it again, then operate your camcorder. → Disconnect the power cord of the AC power adaptor or remove the battery pack. After reconnecting the power source, operate your camcorder.
E:61:□□ E:62:□□	<ul style="list-style-type: none"> A malfunction that you cannot service has occurred. → Contact your Sony dealer or local authorized Sony service facility and inform them of the 5-digit code. (example: E:61:10)

If you are unable to rectify the problem even if you try corrective actions a few times, contact your Sony dealer or local authorized Sony service facility.

Warning indicators and messages

If indicators and messages appear on the LCD screen, in the viewfinder, or in the display window, check the following:
See the page in parentheses “()” for more information.

Warning indicators















Additional Information

* You hear the melody or beep sound.



**This indicator appears in the viewfinder only.

Warning indicators and messages

Warning messages

- | | |
|--|--|
| • CLOCK SET | Reset the date and time. (p. 70) |
| • FOR "InfoLITHIUM"
BATTERY ONLY | Use an "InfoLITHIUM" battery pack. (p. 12) |
| • 8mm TAPE → SP REC
Hi8 TAPE → LP/SP REC | Use Hi8  /Digital8  tapes when you record in the LP mode.* (p. 67) |
| •  TAPE END | The tape has run out.* |
| •  NO TAPE | Insert a cassette tape.* (P. 14) |
| •  CLEANING CASSETTE** | The video heads are dirty. (p. 117) |
| • COPY INHIBIT | You tried to record a picture that has a copyright control signal.* (p. 101) |
| •  FULL | The "Memory Stick" is full.* (DCR-TRV320 only) (p. 78) |
| •  | The write-protect tab on the "Memory Stick" is set to LOCK* (DCR-TRV320 only). (p. 71) |
| •  NO FILE | No still image is recorded on the "Memory Stick"* (DCR-TRV320 only). (p. 88) |
| •  NO MEMORY STICK | No "Memory Stick" is inserted.* (DCR-TRV320 only) (p. 73) |
| •  MEMORY STICK ERROR | The "Memory Stick" data is corrupted.* (DCR-TRV320 only) |
| •  FORMAT ERROR | Check the type of formatting.* (DCR-TRV320 only) |
| •  DIRECTORY ERROR | The "Memory Stick" has more than one directry such as 100 msdcf.* (DCR-TRV320 only) |

* You hear the melody or beep sound.

** The  indicator and " CLEANING CASSETTE" message appear one after another on the LCD screen or in the viewfinder.

Using your camcorder abroad

Using your camcorder abroad

You can use your camcorder in any country or area with the AC power adaptor supplied with your camcorder within 100 V to 240 V AC, 50/60 Hz.

Your camcorder is an NTSC system based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system based TV with VIDEO/AUDIO input jack. The following shows TV color systems used overseas.

NTSC system

Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

PAL system

Australia, Austria, Belgium, China, Czech Republic, Denmark, Finland, Germany, Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Thailand, etc.

PAL-M system

Brazil

PAL-N system

Argentina, Paraguay, Uruguay

SECAM system



Bulgaria, France, Guyana, Hungary, Iran, Iraq, Monaco, Poland, Russia, Ukraine, etc.

Simple setting of clock by time difference


You can easily set the clock to the local time by setting a time difference. Select WORLD TIME in the menu settings. See page 63 for more information.

Maintenance information and precautions

Moisture condensation

If your camcorder is brought directly from a cold place to a warm place, moisture may condense inside your camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or your camcorder may not operate correctly. If there is moisture inside your camcorder, the beep sounds and the  indicator flashes. When the  indicator flashes at the same time, the cassette is inserted in your camcorder. If moisture condenses on the lens, the indicator will not appear.

If moisture condensation occurred

None of the functions except cassette ejection will work. Eject the cassette, turn off your camcorder, and leave it for about 1 hour with the cassette compartment open. Your camcorder can be used again if the  indicator does not appear when the power is turned on again.

Note on moisture condensation

Moisture may condense when you bring your camcorder from a cold place into a warm place (or vice versa) or when you use your camcorder in a hot place as follows:

- You bring your camcorder from a ski slope into a place warmed up by a heating device.
- You bring your camcorder from an air-conditioned car or room into a hot place outside.
- You use your camcorder after a squall or a shower.
- You use your camcorder in a high temperature and humidity place.

How to prevent moisture condensation

When you bring your camcorder from a cold place into a warm place, put your camcorder in a plastic bag and tightly seal it. Remove the bag when the air temperature inside the plastic bag has reached the surrounding temperature (after about 1 hour).

Maintenance information and precautions

Maintenance information

Cleaning the LCD screen



If fingerprints or dust make the LCD screen dirty, we recommend using a LCD Cleaning Kit (not supplied) to clean the LCD screen.

Cleaning the video head

To ensure normal recording and clear pictures, clean the video heads.

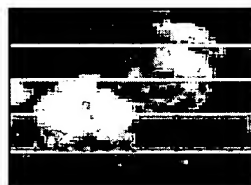
When you playback /record in the Digital8 system

The video head may be dirty when:

- mosaic-pattern noise appears on the playback picture.
- playback pictures do not move.
- playback pictures are hardly visible.
- playback pictures do not appear.
- the  indicator and " CLEANING CASSETTE" message appear one after another on the LCD screen or in the viewfinder.



or



When you play back in the Hi8/Standard 8 (analog) system

The video head may be dirty when:

- playback pictures contain noise.
- playback pictures are hardly visible.
- playback pictures do not appear.



or

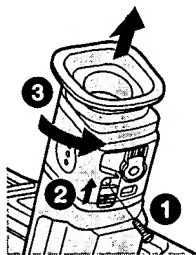


If the above problem occurs, clean the video heads with the Sony V8-25CLD cleaning cassette (not supplied). Check the picture and if the above problem persists, repeat cleaning.

Maintenance information and precautions

Removing dust from inside the viewfinder

- (1) ❶ Remove the screw with a screwdriver (not supplied). ❷ Then, while holding the RELEASE knob up, ❸ turn the eyecup in a counterclockwise direction and pull it out.
- (2) Clean the surface with a commercially available blower for a still camera.
- (3) Turn the eyecup in a clockwise direction, then replace the screw.



Caution

Do not remove any other screws. You may remove only the screw to remove the eyecup.

Precautions

Camcorder operation

- Operate your camcorder on 7.2 V (battery pack) or 8.4 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this operating instructions.
- If any solid object or liquid get inside the casing, unplug your camcorder and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch set to OFF (CHARGE) when you are not using your camcorder.
- Do not wrap your camcorder with a towel, for example, and operate it. Doing so might cause heat to build up inside.
- Keep your camcorder away from strong magnetic fields or mechanical vibration. Noise may appear on the image.
- Do not touch the LCD screen with your fingers or a sharp-pointed object.
- If your camcorder is used in a cold place, a residual image may appear on the LCD screen or in the viewfinder. This is not a malfunction.
- While using your camcorder, the back of the LCD screen may heat up. This is not a malfunction.

On handling tapes

Do not insert anything into the small holes on the rear of the cassette. These holes are used to sense the type and thickness of the tape and if the recording tab is in or out.

Camcorder care

- Remove the tape, and periodically turn on the power, operate the CAMERA and VTR sections and play back a tape for about 3 minutes when your camcorder is not to be used for a long time.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean the camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
- Do not let sand get into your camcorder. When you use your camcorder on a sandy beach or in a dusty place, protect it from the sand or dust. Sand or dust may cause your camcorder to malfunction, and sometimes this malfunction cannot be repaired.

Connection to your PC

- When recording with i.LINK cable the image processed or edited by your PC, use a new Hi8 **Hi8**/Digital8 **D** tape.
- When inputting the image recorded by Hi8/standard 8 (analog) system into your PC, dub the image into a Digital8 **D** or DV tape first, and then input it into your PC.

When inputting the image recorded by Hi8/standard 8 system into Sony VAIO

The Program Capture function of DVgate motion doesn't work. To use this function, dub the image into a Digital8 **D** or DV tape first, and then input it into your Sony VAIO.

Maintenance information and precautions

AC power adaptor

- Unplug the unit from the wall outlet when you are not using the unit for a long time. To disconnect the power cord, pull it out by the plug. Never pull the power cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the power cord forcibly, or place a heavy object on it. This will damage the cord and may cause fire or electrical shock.
- Prevent metallic objects from coming into contact with the metal parts of the connecting section. If this happens, a short may occur and the unit may be damaged.
- Always keep metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment. AM receivers and video equipment disturb AM reception and video operation.
- The unit becomes warm during use. This is not a malfunction.
- Do not place the unit in locations that are:
 - Extremely hot or cold
 - Dusty or dirty
 - Very humid
 - Vibrating

Battery pack

- Use only the specified charger or video equipment with the charging function.
- To prevent accident from a short circuit, do not allow metal objects to come into contact with the battery terminals.
- Keep the battery pack away from fire.
- Never expose the battery pack to temperatures above 60°C (140°F), such as in a car parked in the sun or under direct sunlight.
- Keep the battery pack dry.
- Do not expose the battery pack to any mechanical shock.
- Do not disassemble nor modify the battery pack.
- Attach the battery pack to the video equipment securely.
- Charging while some capacity remains does not affect the original battery capacity.

Note on dry batteries

To avoid possible damage from battery leakage or corrosion, observe the following:

- Be sure to insert the batteries with the + – polarities matched to the + – marks.
- Dry batteries are not rechargeable.
- Do not use a combination of new and old batteries.
- Do not use different types of batteries.
- Current flows from batteries when you are not using them for a long time.
- Do not use leaking batteries.

If batteries are leaking

- Wipe off the liquid in the battery compartment carefully before replacing the batteries.
- If you touch the liquid, wash it off with water.
- If the liquid get into your eyes, wash your eyes with a lot of water and then consult a doctor.

If any problem occurs, unplug your camcorder and contact your nearest Sony dealer.

Specifications

Video camera recorder

System

Video recording system
2 rotary heads
Helical scanning system
Audio recording system
Rotary heads, PCM system
Quantization: 12 bits (Fs 32 kHz, stereo 1, stereo 2), 16 bits (Fs 48 kHz, stereo)
Video signal
NTSC color, EIA standards
Recommended cassette
Hi8/Digital8 video cassette
Recording/playback time (using 120 min. Hi8 video cassette)
SP mode: 1 hour
LP mode: 1 hour and 30 minutes
Fastforward/rewind time (using 120 min. Hi8 video cassette)
Approx. 5 min.
Viewfinder
Electric Viewfinder (monochrome)
Image device
1/4 type CCD
(Charge Coupled Device)
Approx. 460,000 pixels
(Effective: Approx. 290,000 pixels)
Lens
Combined power zoom lens
Filter diameter 1 1/2 in. (37 mm)
25× (Optical), 450× (Digital)
Focal length
3.7 - 92.5 mm (5/32 - 3 3/4 in.)
When converted to a 35 mm still camera
48 - 1200 mm (1 15/16 - 47 1/4 in.)
Color temperature
Auto
Minimum illumination
1 lux (F 1.6)
0 lux (in the NightShot mode)*
* Objects unable to be seen due to the dark can be shot with infrared lighting.

Input/output connectors

S video input/output
4-pin mini DIN
Luminance signal: 1 Vp-p, 75 ohms, unbalanced
Chrominance signal: 0.286 Vp-p, 75 ohms, unbalanced
Audio/Video input/output
AV MINIJACK, 1 Vp-p, 75 ohms, unbalanced, sync negative
327 mV, (at output impedance more than 47 kilohms)
Output impedance with less than 2.2 kilohms/Stereo minijack (ø 3.5 mm)
Input impedance more than 47 kilohms

i DV input/output
4-pin connector
Headphone jack
Stereo minijack (ø 3.5 mm)
LANCØ control jack
(DCR-TRV120)
LANCØ/DIGITAL I/O jack
(DCR-TRV320)
Stereo mini-minijack (ø 2.5 mm)
Transfer rate:
Max 115.2 Kbps
RS-232C based
MIC jack
Stereo minijack (ø 3.5 mm)

LCD screen

Picture
2.5 type
50.3 × 37.4 mm (2 × 1 1/2 in.)
Total dot number
61,600 (280 × 220)

General

Power requirements
7.2 V (battery pack)
8.4 V (AC power adaptor)
Average power consumption (when using the battery pack)
During camera recording using LCD
DCR-TRV120: 3.5 W
DCR-TRV320: 3.9 W
Viewfinder
DCR-TRV120: 3.1 W
DCR-TRV320: 3.3 W
Operating temperature
0 °C to 40 °C (32 °F to 104 °F)
Storage temperature
-20 °C to +60 °C (-4 °F to +140 °F)
Dimensions (Approx.)
107 × 106 × 233 mm
(4 1/4 × 4 1/4 × 9 1/4 in.) (w/h/d)
Mass (approx.)
DCR-TRV120:
930 g (2 lb)
DCR-TRV320:
950 g (2 lb 1 oz)
excluding the battery pack, lithium battery, cassette and shoulder strap
1.1 kg (2 lb 6 oz)
including the battery pack
NP-F330, lithium battery CR2025, 120min. Hi8 cassette, and shoulder strap
Supplied accessories
See page 6.

AC power adaptor

Power requirements
100 - 240 V AC, 50/60 Hz
Power consumption
23 W
Output voltage
DC OUT: 8.4 V, 1.5 A in the operating mode
Operating temperature
0 °C to 40 °C (32 °F to 104 °F)
Storage temperature
-20 °C to +60 °C (-4 °F to +140 °F)
Dimensions (approx.)
125 × 39 × 62 mm
(5 × 1 9/16 × 2 1/2 in.) (w/h/d)
excluding projecting parts
Mass (approx.)
280 g (9.8 oz)
excluding power cord

Battery pack

Output voltage
DC 7.2 V
Capacity
5.0 Wh
Dimensions (approx.)
38.4 × 20.6 × 70.8 mm
(1 9/16 × 13/16 × 2 7/8 in.) (w/h/d)
Mass (approx.)
70 g (2.5 oz)
Type
Lithium ion

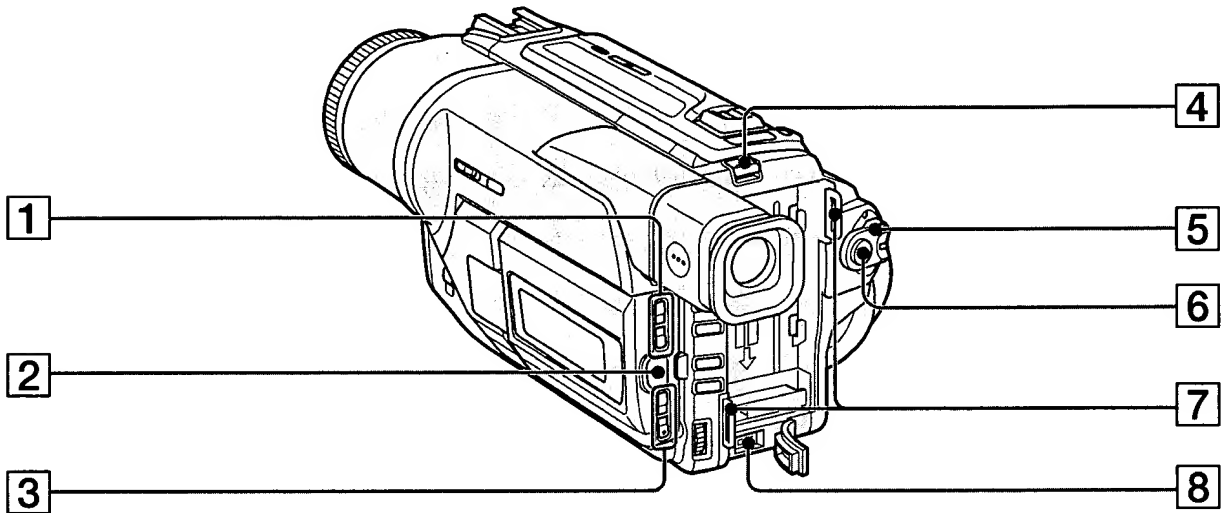
"Memory Stick" (DCR-TRV320 only)

Memory
Flash memory
4MB: MSA-4A
Operating voltage
2.7 - 3.6 V
Power consumption
Approx. 45 mA in the operating mode
Approx. 130 µA in the standby mode
Dimensions (approx.)
50 × 2.8 × 21.5 mm
(2 × 1/8 × 7/8 in.) (w/h/d)
Mass (approx.)
4 g (0.14 oz)

Design and specifications are subject to change without notice.

Identifying the parts and controls

Camcorder



1 LCD BRIGHT buttons (p. 16)

2 OPEN button (p. 15)

3 VOLUME buttons (p. 23)

4 BATT RELEASE lever (p. 9)

5 POWER switch (p. 15)

6 START/STOP button (p. 15)

7 Hooks for shoulder strap (p. 124)

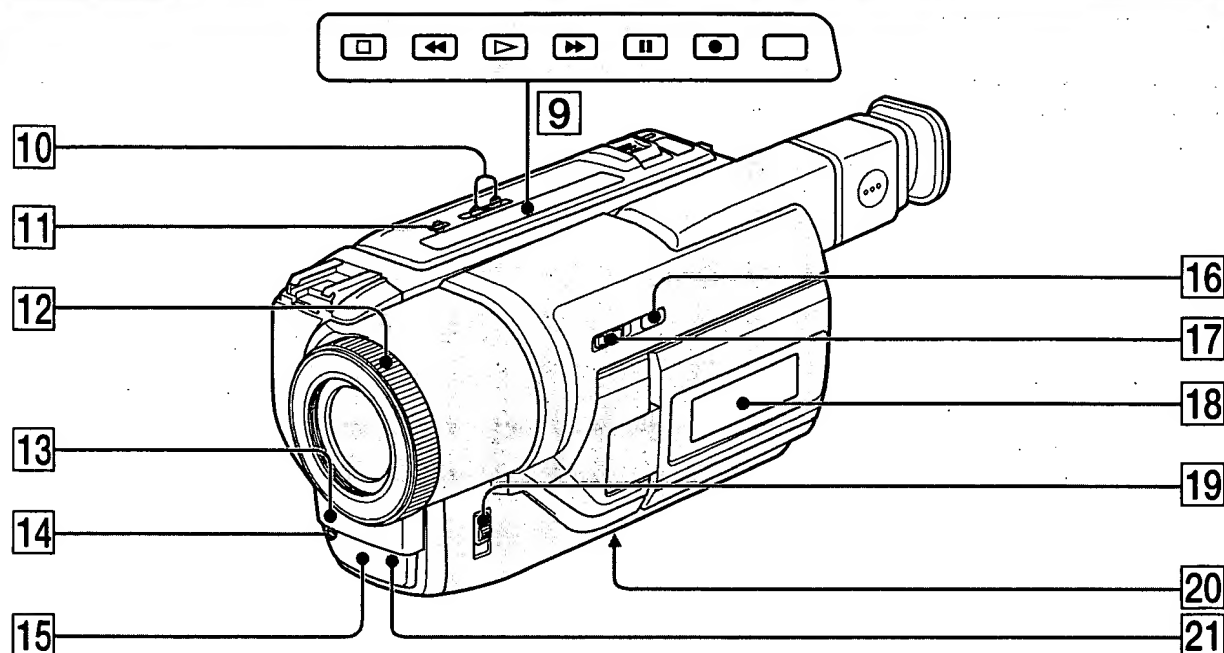
8 DC IN jack (p. 10)



This mark indicates that this product is a genuine accessory for Sony video products.

When purchasing Sony video products, Sony recommends that you purchase accessories with this "GENUINE VIDEO ACCESSORIES" mark.

Identifying the parts and controls



9 Video control buttons (p. 23, 25)

- STOP (stop)
- ◀ REW (rewind)
- ▶ PLAY (playback)
- ▶▶ FF (fastforward)
- || PAUSE (pause)
- REC (recording)

The control buttons light up when you set the POWER switch to VTR.

10 EDITSEARCH buttons (p. 22)

11 S.LASER LINK button (p. 27)

12 Focus ring (p. 42)

13 Microphone

14 Camera recording lamp (p. 15)

15 Infrared rays emitter (p. 19, 27)

16 SUPER NIGHTSHOT button (p. 20)

17 NIGHTSHOT switch (p. 19)

18 Display window (p. 128)

19 FOCUS switch (p. 42)


20 Tripod receptacle (base)

Make sure that the length of the tripod screw is less than 6.5 mm (9/32 inch). Otherwise, you cannot attach the tripod securely and the screw may damage your camcorder.

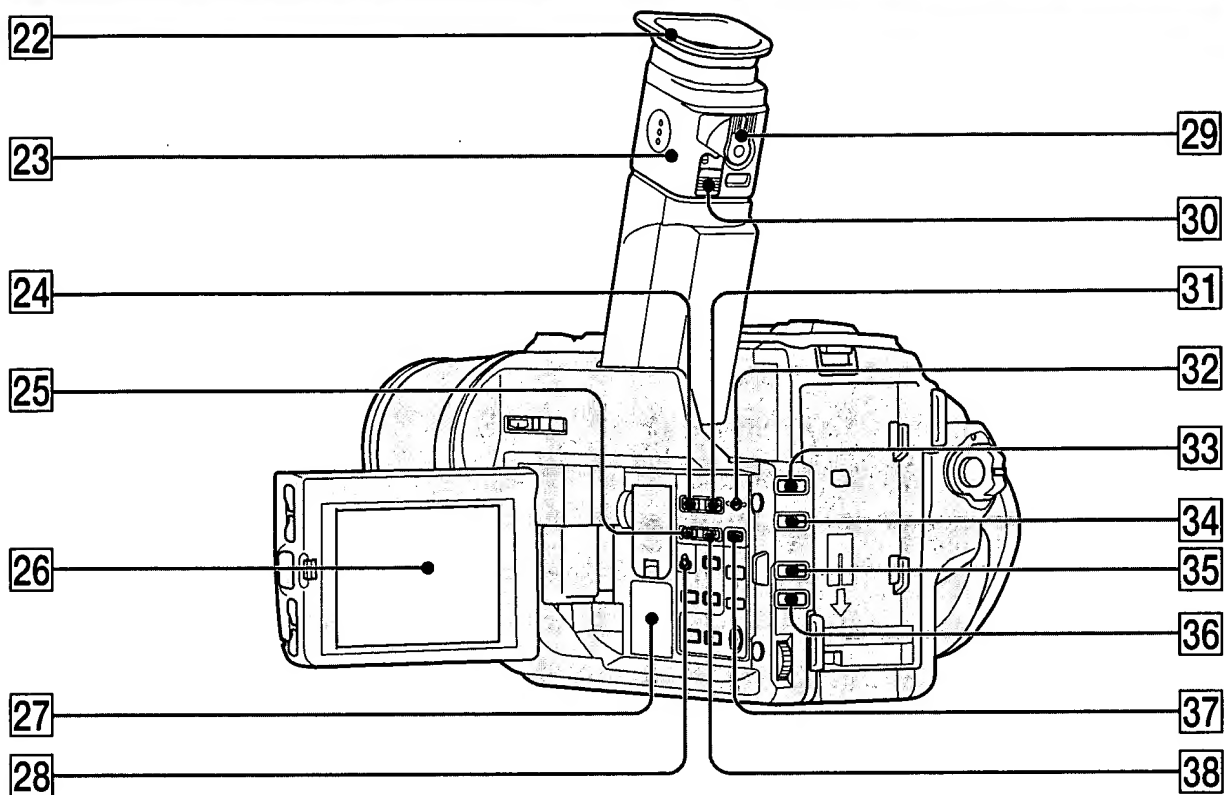
21 Remote sensor


Quick Reference

What is SUPER LASER LINK?

The super laser link system sends and receives pictures and sound between video equipment having the super laser link mark  by using infrared rays.

Identifying the parts and controls

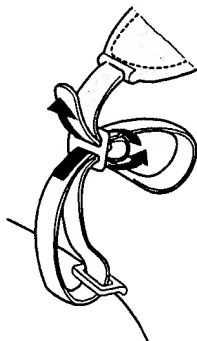


- | | |
|--|---|
| 22 Eyecup | 31 MEMORY INDEX button* (p. 89) |
| 23 Viewfinder (p. 18, 118) | 32 MEMORY DELETE button* (p. 97) |
| 24 MEMORY PLAY button* (p. 88) | 33 FADER button (p. 32) |
| 25 MEMORY - button* (p. 82, 88) | 34 BACK LIGHT button (p. 19) |
| 26 LCD screen (p. 16) | 35 PROGRAM AE button (p. 39) |
| 27 Speaker | 36 EXPOSURE button (p. 41) |
| 28  (self-timer) button* (p. 21, 29, 80) | 37 MEMORY MIX button* (p. 81) |
| 29 Viewfinder lens adjustment lever (p. 18) | 38 MEMORY + button* (p. 82, 88) |
| 30 Eyecup RELEASE knob (p. 118) | |

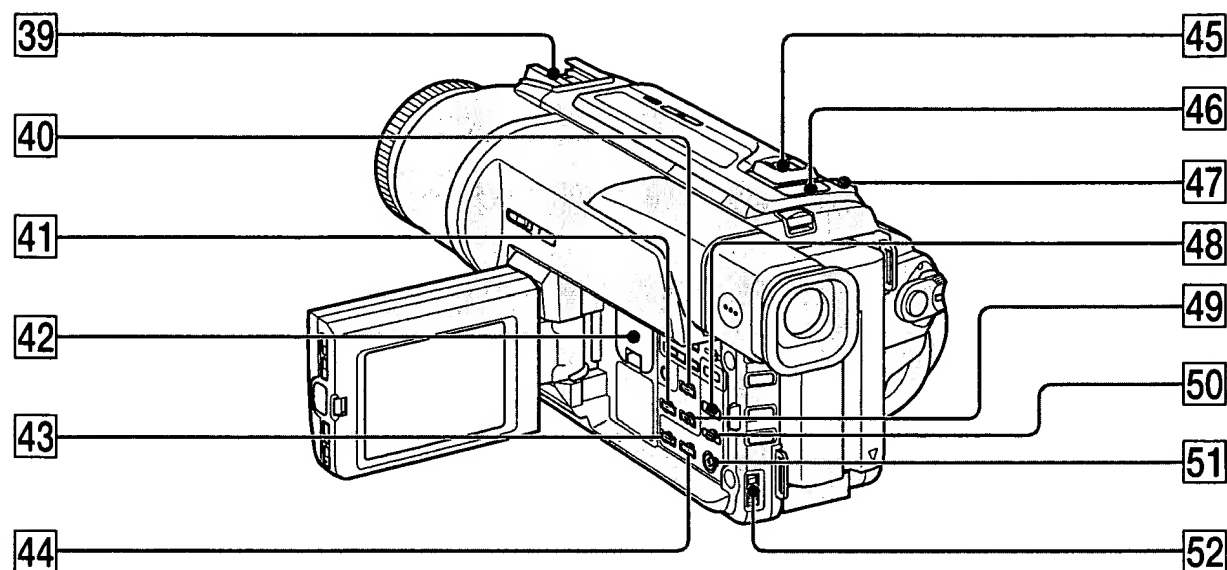
* DCR-TRV320 only

Attaching the shoulder strap

Attach the shoulder strap supplied with your camcorder to the hooks for the shoulder strap.



Identifying the parts and controls



39 Intelligent accessory shoe

40 DATA CODE button (p. 24)

41 DISPLAY button (p. 24)

42 Lithium battery compartment (p. 106)

43 PB ZOOM button (p. 50, 93)

44 TITLE button (p. 43)

45 Power Zoom lever (p. 17)

46 "Memory Stick" lamp*

This lamp lights up while "Memory Stick" is in the "Memory Stick" compartment.

47 PHOTO button (p. 28, 76)

48 DIGITAL EFFECT button (p. 37, 49)

49 END SEARCH button (p. 22)

50 PICTURE EFFECT button (p. 35, 48)

51 MENU button (p. 31, 63)

52 SEL/PUSH EXEC dial (p. 31, 63)

* DCR-TRV320 only

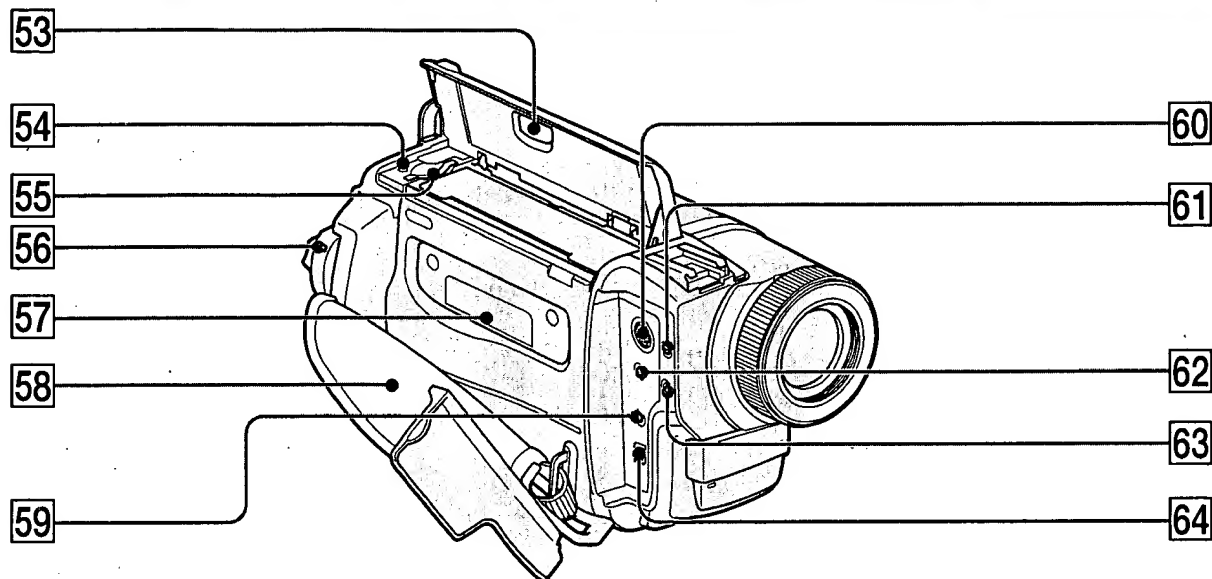
Quick Reference



Notes on the intelligent accessory shoe

- The intelligent accessory shoe supplies power to optional accessories such as a video light or microphone.
- The intelligent accessory shoe is linked to the POWER switch, allowing you to turn the power supplied by the shoe on and off. Refer to the operating instructions of the accessory for further information.
- The intelligent accessory shoe has a safety device for fixing the installed accessory securely. To connect an accessory, press down and push it to the end, and then tighten the screw.
- To remove an accessory, loosen the screw, and then press down and pull out the accessory.

Identifying the parts and controls



53 EJECT button (p. 14)



54 Access lamp* (p. 73)

55 "Memory Stick" compartment* (p. 73)

56 LOCK knob* (p. 15)

57 Cassette compartment (p. 14)

58 Grip strap

59 LANC  control jack (DCR-TRV120)
LANC /DIGITAL I/O jack
(DCR-TRV320)



LANC stands for Local Application Control Bus System. The LANC control jack is used for controlling the tape transport of video equipment and other peripherals connected to the video equipment. This jack has the same function as the jack indicated as CONTROL L or REMOTE.

60 S VIDEO ID-2 jack (p. 26)

61  (headphones) jack

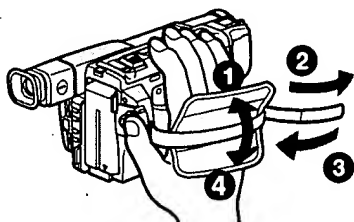
62 AUDIO/VIDEO ID-2 jack (p. 26, 30, 56, 85)

63 MIC (PLUG IN POWER) jack
Connect an external microphone (not supplied). This jack also accepts a "plug-in-power" microphone.

64  DV IN/OUT jack (p. 57, 85)
The  DV IN/OUT jack is i.LINK compatible.

* DCR-TRV320 only

Fastening the grip strap

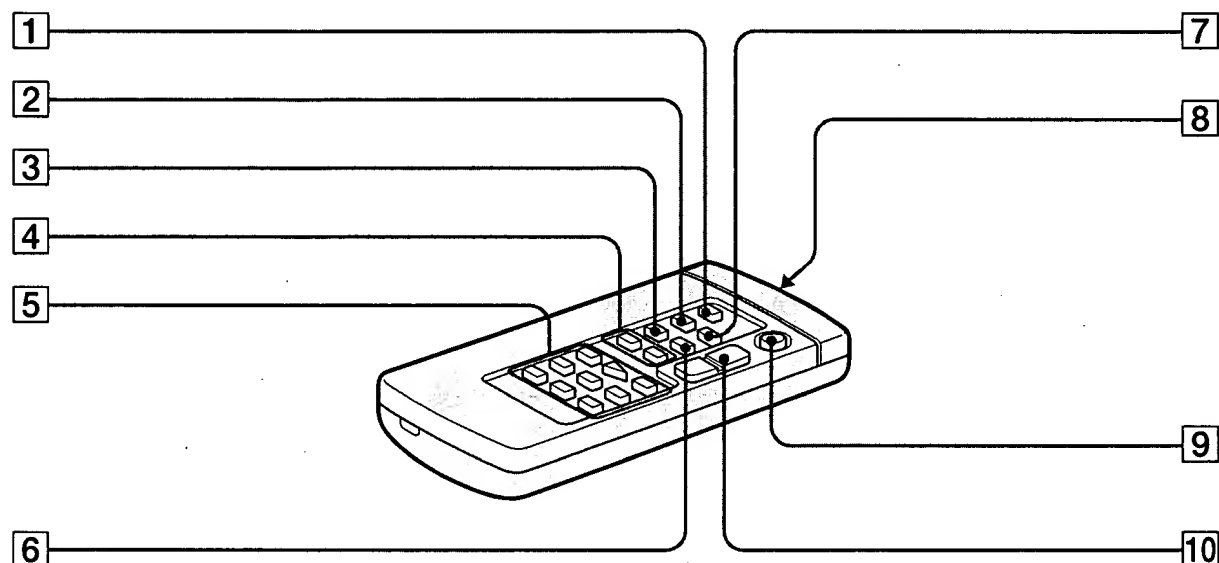


Fasten the grip strap firmly.

Identifying the parts and controls

Remote Commander

The buttons that have the same name on the Remote Commander as on your camcorder function identically to the buttons on your camcorder.

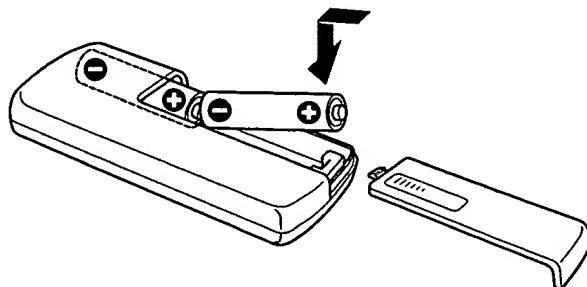


- | | |
|----------------------------------|--|
| 1 PHOTO button (p. 28, 77) | 7 ZERO SET MEMORY button (p. 47, 51) |
| 2 DISPLAY button (p. 24) | 8 Transmitter
Point toward the remote sensor to control the camcorder after turning on the camcorder. |
| 3 SEARCH MODE button (p. 52, 54) | 9 START/STOP button (p. 15) |
| 4 ◀▶/▶▶ buttons (p. 52, 54) | 10 Power zoom button (p. 17) |
| 5 Tape transport buttons (p. 25) | |
| 6 DATA CODE button (p. 24) | |

Quick Reference

To prepare the Remote Commander

Insert 2 R6 (size AA) batteries by matching the + and - polarities on the batteries to the + - marks inside the battery compartment.



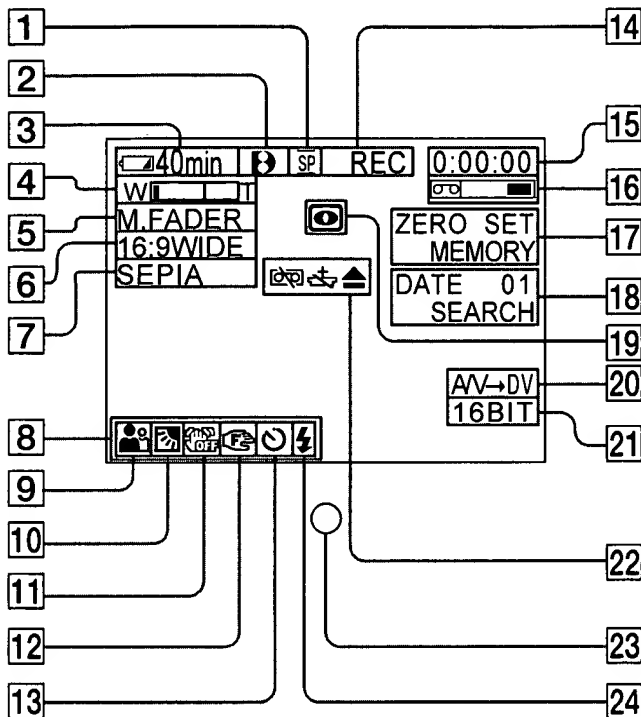
Notes on the Remote Commander

- Point the remote sensor away from strong light sources such as direct sunlight or overhead lighting. Otherwise, the Remote Commander may not function properly.
- Your camcorder works in the Commander mode VTR 2. Commander modes 1, 2 and 3 are used to distinguish your camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR in the Commander mode VTR 2, we recommend changing the Commander mode or covering the sensor of the VCR with black paper.

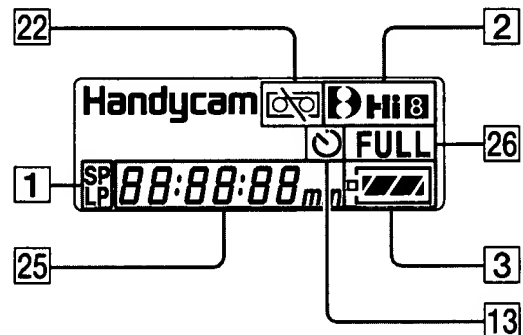
Identifying the parts and controls

Operation indicators

LCD screen and Viewfinder



Display window



- 1 Recording mode indicator (p. 15)/ Mirror mode indicator (p. 16)
- 2 Format indicator (p. 101)
B, Hi8 or 8 indicator appears.
- 3 Remaining battery time indicator (p. 10, 18)
- 4 Zoom indicator (p. 17)/Exposure indicator (p. 41)
- 5 Fader indicator (p. 33)/Digital effect indicator (p. 37, 49)
- 6 Wide mode indicator (p. 31)/ FRAME indicator* (p. 66)
- 7 Picture effect indicator (p. 35, 48)
- 8 LCD bright indicator (p. 16)/Volume indicator (p. 23)/Data code indicator (p. 24)
- 9 PROGRAM AE indicator (p. 40)
- 10 Backlight indicator (p. 19)
- 11 SteadyShot off indicator (p. 64)
- 12 Manual focusing indicator (p. 42)
- 13 Self-timer indicator* (p. 21)
- 14 STBY/REC indicator (p. 15)/Video control mode (p. 25)

- 15 Tape counter indicator (p. 18, 47, 51)/ Time code indicator (p. 18)/Self-diagnosis display indicator (p. 112)/ Tape photo recording indicator (p. 28)
- 16 Remaining tape indicator (p. 18)
- 17 ZERO SET MEMORY indicator (p. 47, 51)
- 18 Search mode indicator (p. 22, 52, 54)
- 19 NIGHTSHOT indicator (p. 19)
- 20 A/V → DV indicator (p. 65)/ DV IN indicator (p. 60)
- 21 Audio mode indicator (p. 67)
- 22 Warning indicators (p. 113)
- 23 Recording lamp (p. 15)
This indicator appears in the viewfinder.
- 24 Video flash ready indicator
This indicator appears when you use the video flash light (not supplied).
- 25 Tape counter indicator (p. 18, 47, 51)/ Time code indicator (p. 18)/Self-diagnosis display indicator (p. 112)/ Remaining battery time indicator (p. 10)
- 26 FULL charge indicator (p. 10)

* DCR-TRV320 only

Quick Function Guide

Functions to adjust exposure (in the recording mode)

- In a dark place NIGHTSHOT (p. 19)
- In insufficient light Low lux mode (p. 39)
- In dark environments such as sunset, fireworks, or general night views Sunset & moon mode (p. 39)
- Shooting backlit subjects BACK LIGHT (p. 19)
- In spotlight, such as at the theater Spotlight mode (p. 39)
- In strong light or reflected light, such as at a beach in midsummer or on a ski slope Beach & ski mode (p. 39)

Functions to give images more impact (in the recording mode)

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* DCR-TRV320 only

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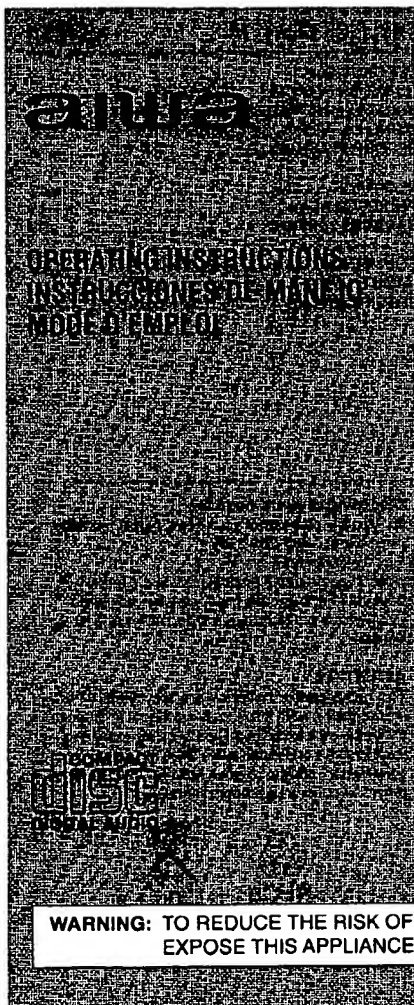
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XP-R100

**COMPACT DISC PLAYER
REPRODUCTOR DE DISCOS
COMPACTOS**

OWNER'S RECORD

For your convenience, record the model number and serial number (you will find them on the bottom of your set) in the space provided below. Please refer to them when you contact your AIWA dealer in case of difficulty.

Model No.

Serial No.

NOTE

FOR USE IN THE U.S.A.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION

Modifications or adjustments to this product, which are not expressly approved by the manufacturer, may void the user's right or authority to operate this product.

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Disposing of Ni-Cd batteries

To properly dispose of your spent Ni-Cd batteries, please call 1-800-289-2492.

"US residents only".

Note: In some areas disposing of Ni-Cd batteries in household or business trash may be prohibited.

Caution: Do not handle damaged or leaking Ni-Cd batteries.

ATTENTION

The rechargeable batteries are recyclable. At the end of their useful life, it may be illegal to dispose the batteries into the municipal waste stream under various state and local laws. Check with your local solid waste officials in your area for details about recycling options or proper disposal.



Ni-Cd



Cd

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Desecho de las baterías de Ni-Cd

Para deshacerse correctamente de las baterías de Ni-Cd gastadas, llame al 1-800-289-2492.

"Sólo para residentes en los EE UU".

Nota: En algunos lugares, el desecho de las baterías de Ni-Cd con el resto de la basura del hogar o de los comercios puede estar prohibido.

Precaución: No toque las baterías de Ni-Cd dañadas o con fugas.

ATENCIÓN

Las baterías recargables pueden reciclarse. Al terminar su vida útil, algunas leyes estatales o locales pueden prohibir deshacerse de las baterías con los residuos municipales. Hable con los encargados de los residuos sólidos locales para más detalles sobre opciones para el reciclado o la mejor forma de deshacerse de las baterías.



Ni-Cd



Cd

Mise au rebut des piles Ni-Cd

Pour savoir où déposer vos piles Ni-Cd usées, veuillez appeler le 1-800-289-2492.

"Résidents aux États-Unis seulement".

Remarque: Dans certains pays, il est interdit de jeter les piles Ni-Cd avec les ordures ménagères ou de bureau.

Avertissement: Ne pas toucher des piles Ni-Cd endommagées ou qui fuient.

ATTENTION

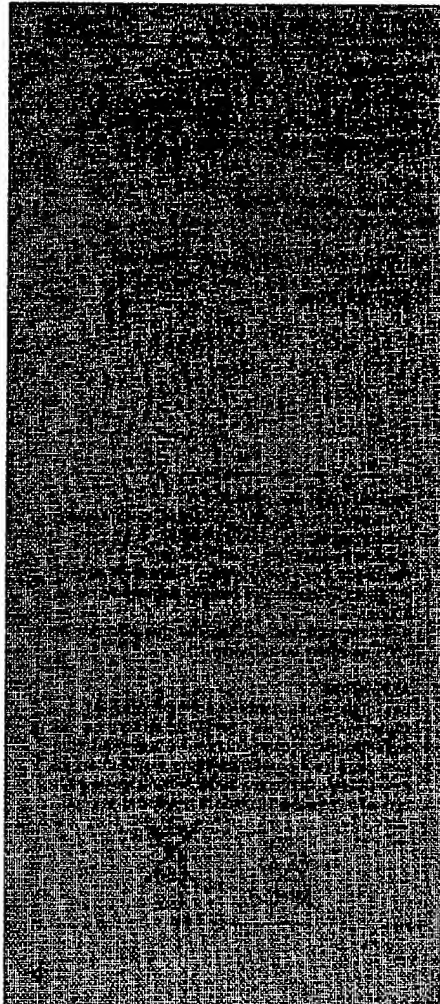
Les piles rechargeables sont recyclables. La réglementation de certains états ou la réglementation locale peut interdire la mise au rebut des piles rechargeables dans les décharges municipales. Contactez la déchetterie locale pour connaître les possibilités de recyclage ou de dépôt.



Ni-Cd



Cd



PRECAUTIONS

English

To maintain good performance

- Do not use the unit in places which are extremely hot, cold, dusty or humid. In particular, do not use or keep the unit in following places.
 - in a high humidity area such as a bathroom
 - near a heater
 - in an area exposed to direct sunlight (e.g., inside a parked car, where it can become extremely hot)
 - near sources of strong magnetism, such as televisions, speakers, or magnets
 - where there is a lot of movement or vibration, such as on a car dashboard or an unstable shelf

For safety

- Do not attempt to disassemble the unit. Laser rays from the optical pickup are dangerous to the eyes.
- Make sure that pins or other foreign object do not get inside the player.
- Take care not to drop the unit or subject it to strong shocks.
- To keep dust from the pickup lens, keep the disc compartment lid closed after use. Never touch the lens.
- If you hear no sound when playing a disc, DO NOT turn the volume up high because music could suddenly start at high volume. Turn the volume control to the lowest level before starting playback and slowly turn it up to the desired level.

Note on listening with the headphones

- Listen at moderate volumes to avoid hearing damage.
- Do not wear the headphones while driving or cycling. It may create a traffic hazard.
- You should use extreme caution or temporarily discontinue use in potentially hazardous situations, such as walking, jogging, etc.
- Wear them properly; L is left, R is right.

Note on condensation

If the unit is suddenly moved from a cold place to a warm one, it may result in condensation on the pickup lens and malfunction or playback difficulties.

Should this occur, leave the unit for a few hours, then try to playback again.

PRECAUCIONES

Español

Para mantener en buen estado de funcionamiento

- No utilice el aparato en lugares muy calientes, fríos, con polvo o humedad. Especialmente, no deje el aparato:
 - en un lugar muy húmedo, por ejemplo en un baño
 - cerca de la calefacción
 - en un lugar expuesto a los rayos del sol (dentro de un coche estacionado donde puede subir mucho la temperatura)
 - cerca de fuentes magnéticas fuertes, por ejemplo televisores, altavoces o imanes
 - donde hay mucho movimiento o vibración, por ejemplo en el cubretablero del coche o estante inestable

Para su seguridad

- No trate de desarmar el aparato. Los rayos láser del receptor óptico pueden dañar sus ojos.
- Asegúrese de que los alfileres u otros objetos extraños no entren en el interior del reproductor.
- Tenga cuidado de no dejar caer el aparato o exponerlo a golpes fuertes.
- Para evitar que el polvo ensucie la lente captora, mantenga la tapa del compartimiento del disco cerrado. No toque nunca la lente.
- Si no se escucha ningún sonido durante la reproducción de un disco, NO suba el volumen porque la música puede empezar repentinamente a un volumen muy alto. Gire el control de volumen a su nivel más bajo antes de empezar a reproducir y gire lentamente hasta el nivel deseado.

Notas para escuchar con los auriculares

- Escuche a un volumen no muy alto para no dañar sus oídos.
- No utilice auriculares durante la conducción o al andar en bicicleta. Puede provocar un accidente de tráfico.
- Debe tener mucho cuidado o dejar de utilizar temporalmente en situaciones potencialmente peligrosas, por ejemplo mientras camina, corre, etc.
- Utilice correctamente: L es para la izquierda y R para la derecha.

Nota sobre la condensación

Si se lleva repentinamente el aparato de un lugar frío a un lugar caliente puede condensarse la humedad en la lente captora y provocar un mal funcionamiento o problemas en la reproducción. En este caso, deje descansar el aparato unas horas y trate de volver a reproducir.

PRÉCAUTIONS

Français

Pour assurer une performance optimale du lecteur CD

- N'utilisez pas l'appareil dans des lieux extrêmement chauds, froids, poussiéreux ou humides. En particulier, n'utilisez pas et ne laissez pas l'appareil dans les endroits suivants:
 - extrêmement humides, comme une salle de bains
 - à proximité d'un appareil de chauffage
 - exposés à la lumière directe du soleil (par ex. dans une voiture garée en plein soleil, car l'habitacle peut devenir extrêmement chaud)
 - à proximité d'une source de magnétisme puissante, comme un téléviseur, une enceinte ou un aimant
 - exposés à des vibrations ou mouvements intenses, comme sur le tableau de bord d'une voiture ou une étagère instable

Sécurité

- N'essayez pas de démonter l'appareil. Les rayons laser provenant du bloc de lecture sont dangereux pour la vue.
- Prenez garde de ne pas laisser tomber d'épingles ou autres objets dans l'appareil.
- Prenez garde de ne pas laisser tomber l'appareil ni à le soumettre à des chocs violents.
- Afin d'éviter que de la poussière ne se dépose sur la lentille de lecture, laissez toujours le volet du logement de disque fermé après avoir utilisé le lecteur. Ne touchez jamais la lentille.
- Si vous n'entendez pas de son pendant la lecture d'un disque, N'AUGMENTEZ PAS trop le volume car la musique pourrait brutalement démarrer à un volume très fort. Avant la lecture, réduisez complètement le volume et augmentez-le lentement jusqu'au niveau souhaité.

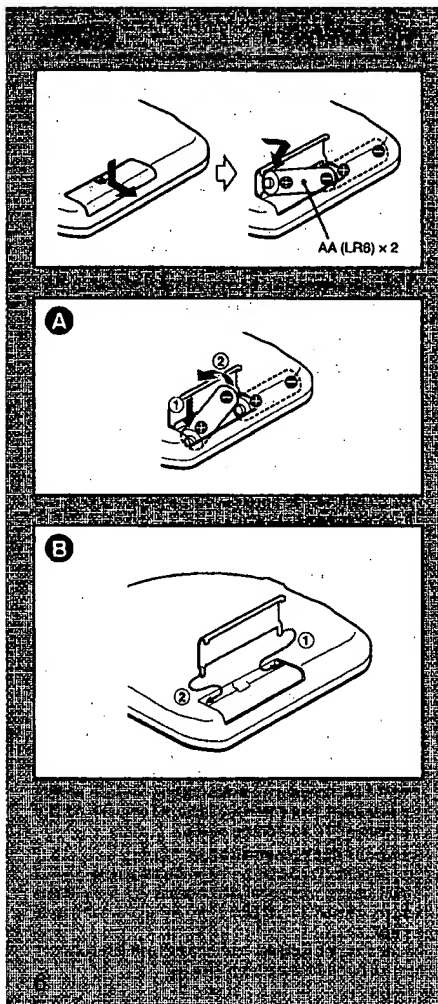
Remarques sur l'écoute aux écouteurs

- Écoutez à un niveau modéré pour éviter toute lésion auditive.
- Ne portez pas les écouteurs pendant la conduite d'un véhicule ou d'une moto (vélo). Vous pourriez occasionner un accident.
- Montrez-vous très prudent ou arrêtez temporairement d'utiliser l'appareil en cas de situation potentiellement dangereuse, par exemple pendant la marche, le jogging etc.
- Portez les écouteurs correctement: l'oreillette portant la marque "L" sur l'oreille gauche et l'oreillette portant la marque "R" sur l'oreille droite.

Remarque sur la condensation

Si vous portez l'appareil d'un endroit froid dans un endroit chaud, de l'humidité peut se condenser sur la lentille de lecture, causant un problème de fonctionnement ou de lecture.

Le cas échéant, n'utilisez pas l'appareil pendant quelques heures, puis remettez-le en marche.



USING ON DRY CELL BATTERIES English

Open the battery compartment and insert two size **AA (LR6) alkaline batteries** with the **+** and **-** marks correctly aligned.

Battery replacement → ④

The OPE/BATT Indicator changes from F (green) to M (orange) to E (red) according to the remaining power of the batteries. Replace the batteries when E (red) lights. If the unit remains in use after E (red) lights, "Lo-bAtt" appears (during CD operation only), and the operation stops.

Battery life (EIAJ 1 mW using alkaline batteries LR6)
Approx. 12 hours

Battery life may vary depending on the conditions of use.

If the cover of the battery compartment comes off
→ ⑤

Note on dry cell batteries

- Make sure that the **+** and **-** marks are correctly aligned.
- Do not mix the different types of batteries, or an old battery with a new one.
- To prevent the risk of electrolyte leakage or explosions, never recharge the batteries apply heat to them, or take them apart.
- When not using the batteries, remove them to prevent needless battery wear.
- If liquid leaks from the batteries, wipe thoroughly to remove.

USO DE PILAS

Español

- Abra el portapilas y coloque dos pilas alcalinas tamaño AA (LR6) con las marcas + y - correctamente alineadas.

Cambio de las pilas → ④

El indicador OPE/BATT cambia de F (verde) a M (naranja) a E (rojo) de acuerdo con la carga remanente de las pilas. Cambie las pilas cuando se encienda la luz E (roja). Si se sigue utilizando el aparato después de que se enciende la luz E (roja), aparece "Lo-bAtt" (sólo durante el funcionamiento con el disco compacto) y deja de funcionar.

Longevidad de las pilas (EIAJ a 1 mW con pilas alcalinas LR6)

Aprox. 12 horas

La longevidad de las pilas depende de las condiciones de uso.

Si se sale la tapa del portapilas → ⑤

Notas sobre las pilas

- Compruebe que las marcas + y - están correctamente alineadas.
- No mezcle pilas de distinto tipo o una pila vieja con otra nueva.
- Para evitar que se produzcan fugas de electrolito o explosiones, no recargue las pilas, caliente o desarme.
- Cuando no se utilicen las pilas, sáquelas para evitar que se desgasten inútilmente.
- Si se produce una fuga del líquido de las pilas, limpie a fondo para eliminar los restos.

UTILISATION SUR PILES SÈCHES

Français

Ouvrez le logement des piles et insérez deux piles alcalines taille AA (LR6) avec les pôles + et - dirigés dans le bon sens.

Remplacement des piles → ④

L'indicateur OPE/BATT passe de F (vert) à M (orange) et E (rouge) en fonction de la puissance restante des piles. Remplacez les piles quand E (rouge) s'allume. Si vous continuez à utiliser l'appareil alors que E (rouge) est allumé, "Lo-bAtt" apparaîtra (pendant l'opération CD seulement) et l'appareil s'arrêtera.

Autonomie des piles (1 mW EIAJ avec piles alcalines LR6)

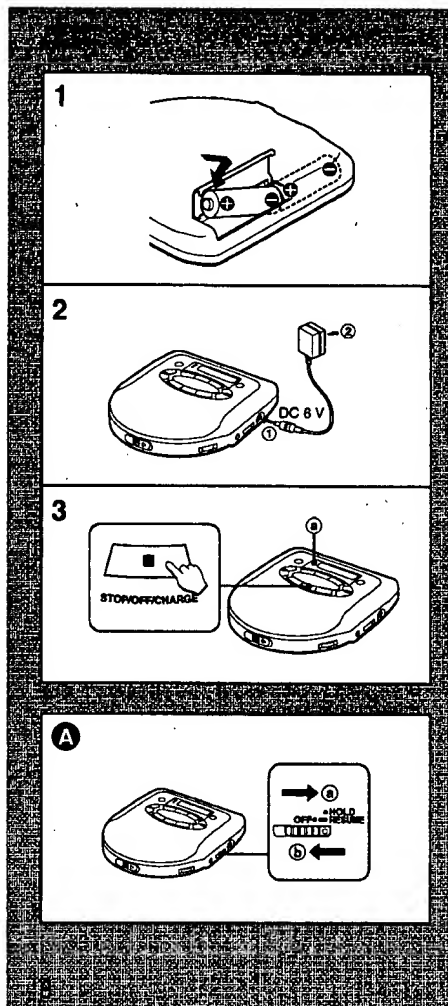
Env. 12 heures

L'autonomie des piles peut varier selon les conditions d'utilisation.

Si le couvercle du logement des piles se détache → ⑤

Remarques sur les piles sèches

- Vérifiez que les marques + et - sont correctement alignées.
- Ne pas insérer en même temps différents types de piles, ou une pile usée et une pile neuve.
- Afin d'éviter les risques d'explosion ou de fuite d'électrolyte, ne jamais recharger les piles, les chauffer ni les ouvrir.
- Quand vous n'utilisez pas les piles, enlevez-les pour éviter qu'elles ne s'usent inutilement.
- Si les piles fuient, essuyez bien le logement pour enlever tout le liquide.



USING ON RECHARGEABLE BATTERIES

English

- Be sure to use size AA Ni-Cd 1.2 V 700 mAh rechargeable batteries, which are commercially available.
- Be sure to read the instructions of the purchased rechargeable batteries before use.
- When using on the rechargeable batteries for the first time, charge them until the battery indicators go out.
- Before charging the batteries, close the disc compartment. You cannot charge the batteries while it is opened.

- 1 Insert the rechargeable batteries with the and marks correctly aligned.
- 2 Connect the AC adaptor.
① to DC 6 V jack
② to wall outlet
- 3 Keep pressed for about 1 second to start charging.
"C-on" appears, and OPE/BATT indicators light. When charging is completed, "C-OFF" flashes a few times, and the OPE/BATT indicators go out. After charging, disconnect the AC adaptor.

Time to recharge the batteries

Recharge the batteries when E (red) lights. If the unit remains in use after E (red) lights, "Lo-bAtt" appears (during CD operation only) and the current operation stops.

To stop charging

Press during charging.

USING ON AC HOUSE CURRENT

Connect the supplied AC adaptor in the same way as recharging the batteries.

During operation on AC house current, all of the OPE/BATT indicators light.

BEFORE PLAYBACK

HOLD switch →

Release the HOLD switch before playback. →

When not using the unit, set the HOLD switch to the HOLD position. Accidentally pressed button will not function. →

If buttons are pressed when the HOLD switch is set to HOLD position, "HOLD" flashes in the display.

USO DE BATERIAS RECARGABLES Español

- Utilice baterías recargables de Ni-Cd de tamaño AA de 1,2 V 700 mAh en venta en los comercios de artículos eléctricos.
- Lea las instrucciones de las baterías recargables adquiridas antes de usarlas.
- Cuando utilice baterías recargables por primera vez, cargue hasta que se apague el indicador de batería.
- Antes de cargar las baterías, cierre el compartimiento del disco. No puede cargar las baterías cuando está abierto.

- 1 Coloque las baterías recargables con las marcas ① y ② correctamente alineadas.
- 2 Conecte el adaptador de CA.
① a la toma DC 6 V
② al tomacorriente de la pared
- 3 Mantenga presionado ■ STOP/OFF/CHARGE durante aprox. 1 segundo para empezar a cargar. Aparece "C-on" y se encienden los indicadores OPE/BATT ③.
Cuando se ha cargado completamente, destella "C-OFF" varias veces y se apagan los indicadores OPE/BATT. Después de la carga, desconecte el adaptador CA.

Tiempo para cargar las baterías

Cargue las baterías cuando se encienda E (rojo). Si se sigue utilizando el aparato después de encenderse E (rojo), aparece "Lo-bAtt" (sólo durante el funcionamiento con el disco compacto) y se detiene el funcionamiento actual.

Para dejar de cargar

Presione ■ STOP/OFF/CHARGE durante la carga.

USO DE LA CA DEL HOGAR

Conecte el adaptador de CA suministrado de la misma forma que lo haría para cargar las baterías. Cuando se hace funcionar con la CA del hogar, se encienden todos los indicadores OPE/BATT.

ANTES DE REPRODUCIR

Interruptor HOLD → ①

Suelte el interruptor HOLD antes de reproducir. → ②
Cuando no utilice el aparato mueva el interruptor HOLD a la posición HOLD. No funcionará aunque presione accidentalmente un botón. → ③
Si se presionan botones con el interruptor HOLD en la posición HOLD, destella "HOLD" en la pantalla.

UTILISATION SUR PILES RECHARGEABLES

Français

- Utilisez seulement des piles rechargeables Ni-Cd 1,2 V 700 mAh de format AA, en vente dans le commerce.
- Lisez les instructions concernant les piles rechargeables achetées avant utilisation.
- Si vous utilisez l'appareil sur des piles rechargeables neuves, rechargez les piles jusqu'à ce que le témoin de piles s'éteigne.
- Avant de recharger les piles, fermez le volet du logement de disque. Vous ne pouvez pas recharger les piles si le volet reste ouvert.

- 1 Insérez des piles rechargeables en dirigeant les pôles ① et ② dans le bon sens.
- 2 Raccordez l'adaptateur secteur.
① à la prise DC 6 V
② à une prise murale
- 3 Maintenez ■ STOP/OFF/CHARGE pressé environ 1 seconde pour démarrer la charge.
"C-on" apparaît, et les indicateurs OPE/BATT ③ s'allument.
Quand la charge est terminée, "C-OFF" clignote plusieurs fois, et les indicateurs OPE/BATT s'éteignent. Après la charge, déconnectez l'adaptateur secteur.

Quand recharger les piles

Rechargez les piles quand E (rouge) s'allume. Si vous continuez à utiliser l'appareil alors que E (rouge) est allumé, "Lo-bAtt" apparaît (pendant l'opération CD seulement) et l'appareil s'arrête.

Pour arrêter la recharge

Appuyez sur ■ STOP/OFF/CHARGE pendant la recharge.

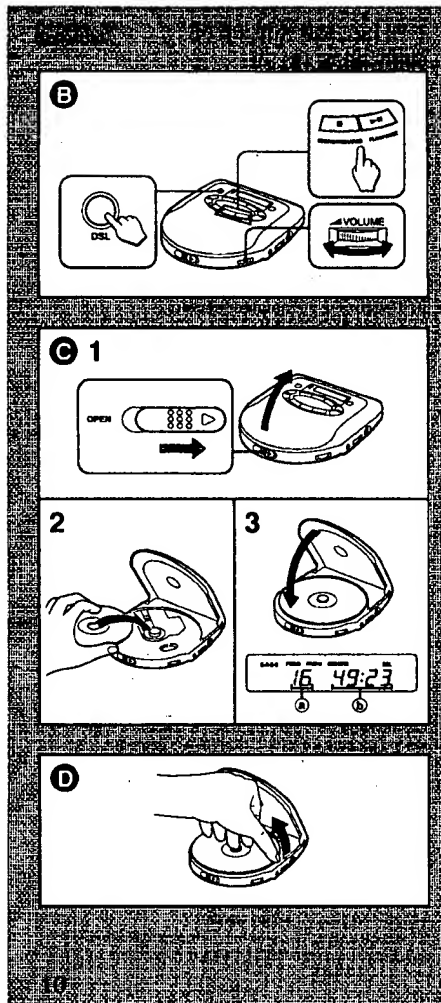
UTILISATION SUR LE COURANT SECTEUR

Raccordez l'adaptateur secteur de la même façon que pour la recharge des piles.
Quand l'appareil fonctionne sur le courant secteur, tous les indicateurs OPE/BATT de piles s'allument.

INFORMATIONS PRÉLIMINAIRES

Commutateur de blocage des touches (HOLD) → ①

Libérez le commutateur HOLD avant la lecture. → ②
Lorsque vous n'utilisez pas l'appareil, réglez le commutateur HOLD sur la position HOLD (blocage des touches). Si vous appuyez par hasard sur une touche, elle ne fonctionnera pas. → ③
Si vous appuyez sur une touche quand le commutateur HOLD est à la position HOLD, "HOLD" clignote sur l'afficheur.



BEFORE PLAYBACK

English

Turning on and off → B

Turning the power on

Press **▶||** PLAY/PAUSE. Power is turned on and playback starts.

Note

"Er" appears on the display when you play a disc placed upside-down or a defective disc.

Turning off the power

If no new operations are done within 30 seconds from the end of last operation, the power is turned off automatically. (Auto power off function)

- You can turn off the power by pressing the **■** STOP/OFF/CHARGE before it is automatically turned off.

Standby mode → B

When an operation finishes, the unit goes into standby mode until the auto power off function automatically turns off the power.

To enter standby mode, press **▶||** PLAY/PAUSE to start playback, then press **■** STOP/OFF/CHARGE.

Adjusting the sound → B

Volume

Turn the VOLUME control to adjust the volume.

DSL

Press DSL for more powerful sound and deeper bass.

DSL : Deep bass is emphasized.

DSL : Deep bass is strongly emphasized.

DSL : Normal sound

Inserting a disc → C

- 1 Slide the OPEN switch to open the disc compartment.
 - 2 Place a disc in the center with the label side facing up.
 - 3 Close the disc compartment.
- Ⓐ Total number of tracks
Ⓑ Total playing time

To remove the disc → D

Pick up the disc, holding its edge, while pressing the pivot gently.

ANTES DE REPRODUCIR

Español

Conexión y desconexión → B

Conexión del aparato

Presione ►►►PLAY/PAUSE. Se conecta el aparato y empieza la reproducción.

Nota

Aparece "Err" en la pantalla al reproducir un disco al revés o un disco averiado.

Desconexión del aparato

Si no se hacen nuevas operaciones antes de 30 segundos desde que terminó la última operación, se desconecta automáticamente el aparato. (Función de desconexión automática)

- Se puede desconectar el aparato antes de que funcione la desconexión automática presionando el botón ■STOP/OFF/CHARGE.

Modo de espera → B

Cuando termina de hacer funcionar, el aparato se conmuta al modo de espera hasta que funcione automáticamente la detección automática.

Para entrar en el modo de espera, presione ►►►PLAY/PAUSE para empezar la reproducción y, después, presione ■STOP/OFF/CHARGE.

Ajuste del sonido → B

Volumen

Gire el control de VOLUME para ajustar su nivel.

DSL

Presione DSL para sonidos más poderosos y graves más intensos.

- DSL : Se da énfasis a graves intensos.
- DSL : Se da énfasis fuerte a los graves intensos.
- DSL : Sonido normal

Colocación de un disco → C

- 1 Deslice el Interruptor OPEN para abrir el compartimiento del disco.
- 2 Coloque un disco en el centro con el lado de etiqueta hacia arriba.
- 3 Cierre el compartimiento del disco.
 - Ⓐ Número total de canciones
 - Ⓑ Tiempo de reproducción total

Para sacar el disco → D

Tome el disco por sus bordes mientras presiona suavemente sobre el pivote.

INFORMATIONS PRÉLIMINAIRES

Français

Mise sous et hors tension du lecteur → B

Mise sous tension

Appuyez sur ►►►PLAY/PAUSE. Le lecteur se met sous tension et la lecture commence.

Remarque

"Err" s'affiche à la lecture d'un disque inséré à l'envers ou défectueux.

Mise hors tension

Si vous n'effectuez aucune opération dans les 30 secondes suivant la fin de la dernière opération, l'appareil se met automatiquement hors tension. (fonction de coupure automatique)

- Vous pouvez mettre hors tension en appuyant sur ■STOP/OFF/CHARGE avant la coupure automatique.

Mode de veille → B

Quand une opération est terminée, l'appareil se met en veille jusqu'à l'arrêt automatique.

Pour mettre l'appareil en mode de veille, appuyez sur ►►►PLAY/PAUSE pour commencer la lecture, puis sur ■STOP/OFF/CHARGE.

Réglage du son → B

Volume

Ajustez le volume avec la commande VOLUME.

DSL

Appuyez sur DSL pour obtenir des graves plus puissants et omniprésents.

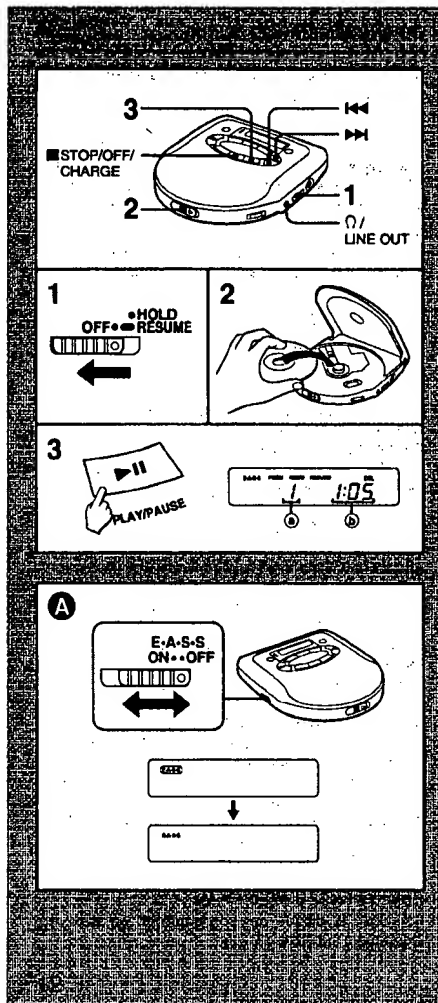
- DSL : Accentuation normale des graves.
- DSL : Accentuation marquée des graves.
- DSL : Son normal

Mise en place d'un disque → C

- 1 Faites glisser le commutateur OPEN pour ouvrir le volet du logement de disque.
- 2 Placez un disque au centre, la face portant l'étiquette vers le haut.
- 3 Refermez le volet du logement de disque.
 - Ⓐ Nombre total de plages
 - Ⓑ Temps total de lecture

Pour retirer le disque → D

Saisissez le disque par son pourtour, en appuyant légèrement sur l'axe.



PLAYBACK

English

Connect the supplied headphones to the ϕ /LINE OUT jack.

- 1 Release HOLD.
 - 2 Place a disc.
 - 3 Press **▶||** PLAY/PAUSE.
- Playback starts from the first track.
- Ⓐ track number
Ⓑ elapsed playing time

Basic operation

To stop	Press ■ STOP/OFF/CHARGE.
To pause	Press ▶ PLAY/PAUSE. To resume, press again.
To search for the beginning of a track	Press ◀◀ or ▶▶ .
To locate a desired passage	Keep ◀◀ or ▶▶ pressed. Release the button at the start of desired passage.

E•A•S•S PLUS (Electric Anti-Shock System)

→ Ⓐ

The E•A•S•S PLUS function reduces skipping or muting of the sound when the unit is subjected to shocks. The player keeps about 10 seconds of playback sound in its memory.

Set the E•A•S•S switch to ON.

The unit keeps 10 seconds in memory.

To cancel the E•A•S•S PLUS function, set the E•A•S•S switch to OFF.

REPRODUCCION

Español

Conecte los auriculares suministrados en la toma Ω /LINE OUT.

- 1 Suelte HOLD.
 - 2 Coloque un disco.
 - 3 Presione $\blacktriangleright\|$ PLAY/PAUSE.
- Empieza a reproducir desde la primera canción.
- Ⓐ Número de canción
Ⓑ Tiempo de reproducción transcurrido

Funciones básicas

Para parar	Presione \blacksquare STOP/OFF/CHARGE.
Para hacer una pausa	Presione $\blacktriangleright\ $ PLAY/PAUSE. Para seguir, vuelva a presionar.
Para hacer una búsqueda del principio de una canción	Presione \lll o \ggg .
Para buscar un determinado punto de la canción	Mantenga presionado \lll o \ggg . Suelte el botón al llegar al punto deseado.

E•A•S•S PLUS (Sistema Anti-Choque Electrónico)

→ Ⓐ

La función E•A•S•S PLUS reduce los saltos o silencios del sonido cuando el aparato recibe un golpe. El reproductor mantiene unos 10 segundos del sonido reproducido en la memoria.

Ajuste el interruptor E•A•S•S a ON.

El aparato mantiene 10 segundos en la memoria. Para cancelar la función E•A•S•S PLUS, mueva el interruptor E•A•S•S a OFF.

LECTURE

Français

Raccordez les écouteurs fournis à la prise Ω /LINE OUT.

- 1 Libérez HOLD.
 - 2 Posez un disque.
 - 3 Appuyez sur $\blacktriangleright\|$ PLAY/PAUSE.
- La lecture commence à partir de la première plage.
- Ⓐ Numéro de plage
Ⓑ Temps de lecture écoulé

Opérations élémentaires

Pour arrêter	Appuyez sur \blacksquare STOP/OFF/CHARGE.
Pour faire une pause	Appuyez sur $\blacktriangleright\ $ PLAY/PAUSE. Pour poursuivre la lecture, appuyez une nouvelle fois.
Pour localiser le début d'une plage	Appuyez sur \lll ou \ggg .
Pour localiser un passage	Appuyez en continu sur \lll ou \ggg . Relâchez la touche au début du passage souhaité.

E•A•S•S PLUS (Système Antichoc Électronique)

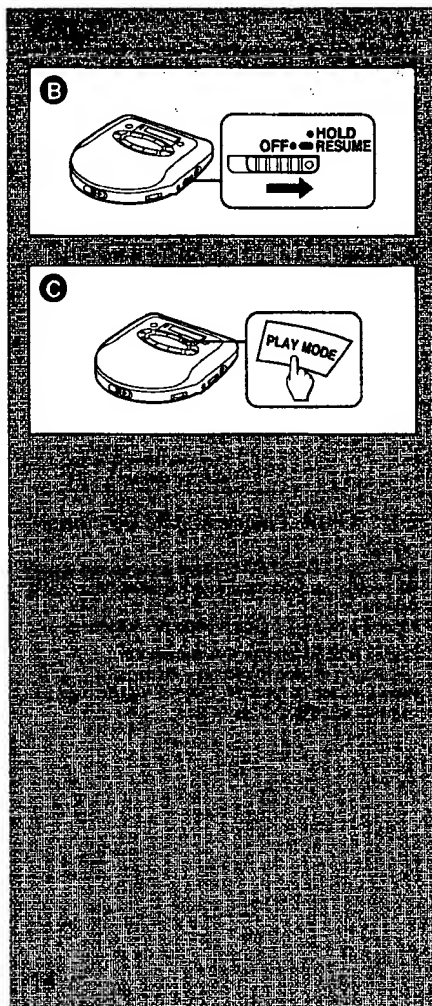
→ Ⓐ

La fonction E•A•S•S PLUS réduit les coupures du son qui peuvent se produire lorsque l'appareil est soumis à des chocs.

Le lecteur peut mémoriser environ 10 secondes de son.

Réglez le commutateur E•A•S•S sur ON.

L'appareil maintient 10 secondes en mémoire. Pour annuler la fonction E•A•S•S PLUS, réglez le commutateur E•A•S•S sur OFF.



PLAYBACK

English

Resume function → B

Set the HOLD switch to RESUME.

RESUME appears, and you can start playback from the point where you stopped playback by pressing ■ STOP/OFF/CHARGE.

When the resume function is on, all-track repeat is selected automatically.

To cancel resume play, set the HOLD switch to OFF.

Note

- Resume play may start at a point about 30 seconds behind or ahead the stopped point. Resume play may not operate if you stopped at the last 30 seconds of the final track.
- Resume play will be canceled if you open the disc compartment. If you change disc while the unit is turned off, set the HOLD switch to OFF to start playback from the beginning of the new disc.

Random play → C

Press PLAY MODE in standby mode to display **RNDM**. Tracks on the disc are played in random order.

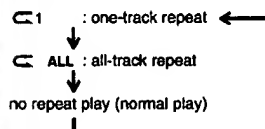
To cancel random play, press PLAY MODE in standby mode. **RNDM** display changes to RNDM.

Note

- You cannot back to previous track by pressing ◀◀ during random play.
- You cannot select one-track repeat during random play.

Repeat play → C

Press PLAY MODE during playback to select repeat play as follows.



Signal sounds

Beep sounds are heard when you start operation by pressing a button.

To cancel the beep sound, press ■ STOP/OFF/CHARGE to turn the power off, then press ▶▶ PLAY/PAUSE while pressing PLAY MODE.

REPRODUCCION

Español

Función de continuación → ③

Mueva el interruptor HOLD a RESUME.

Aparece **RESUME** y puede empezar a reproducir desde el punto donde se paró la reproducción presionando **■ STOP/OFF/CHARGE**.

Cuando la función de continuación está activada, se selecciona automáticamente la repetición de todas las canciones.

Para cancelar la continuación de la reproducción, mueva el interruptor HOLD a OFF.

Notas

- Puede empezar la continuación de la reproducción en un punto unos 30 segundos antes o después del punto de parada. La continuación de la reproducción puede no funcionar si se ha parado en los últimos 30 segundos de la última canción.
- Se cancelará la continuación de la reproducción si se abre el compartimiento del disco. Si cambia el disco cuando el aparato está desconectado, mueva el interruptor HOLD a OFF para empezar a reproducir desde el principio de un nuevo disco.

Reproducción aleatoria → ④

Presione **PLAY MODE** durante el modo de espera para que aparezca **RNDM**.

Las canciones del disco se reproducen en orden aleatorio.

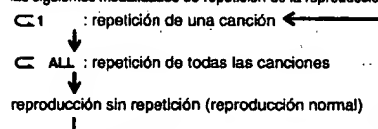
Para cancelar la reproducción aleatoria, presione **PLAY MODE** durante el modo de espera, la indicación **RNDM** cambia a **RNDM**.

Notas

- No puede volver hacia atrás una canción presionando **⏮** durante la reproducción aleatoria.
- No se puede seleccionar la repetición de una pista durante la reproducción aleatoria.

Repetición de la reproducción → ⑤

Presione **PLAY MODE** durante la reproducción para seleccionar las siguientes modalidades de repetición de la reproducción.



Sonidos de señal

Se escucha un timbre al presionar un botón para que empiece a funcionar.

Para cancelar el timbre, presione **■ STOP/OFF/CHARGE** para desconectar el aparato y presione **▶II PLAY/PAUSE** mientras presiona **PLAY MODE**.

LECTURE

Français

Fonction de reprise de la lecture → ③

Réglez le commutateur HOLD à RESUME.

RESUME apparaît, et vous pouvez commencer la lecture à partir du point où vous aviez arrêté la lecture en appuyant sur **■ STOP/OFF/CHARGE**.

Quand la fonction de reprise est en service, la répétition de toutes les plages est automatiquement sélectionnée.

Pour annuler la reprise de la lecture, réglez le commutateur HOLD à OFF.

Remarques

- Le point de reprise de la lecture peut être décalé de 30 secondes environ du point d'arrêt. Si vous avez arrêté la lecture à moins de 30 secondes de la dernière plage, la fonction risque d'être inopérante.
- La lecture de reprise sera annulée si vous ouvrez le volet du logement de disque. Si vous changez de disque alors que l'appareil est hors tension, réglez le commutateur HOLD à OFF pour démarrer la lecture depuis le début du nouveau disque.

Lecture aléatoire → ④

Appuyez sur **PLAY MODE** en mode de veille pour afficher **RNDM**.

Les plages du disque sont reproduites dans un ordre quelconque.

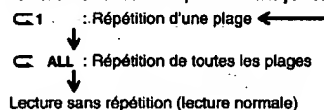
Pour annuler la lecture aléatoire, appuyez sur **PLAY MODE** en mode de veille. L'affichage **RNDM** passe à **RNDM**.

Remarques

- Vous ne pouvez pas revenir à la plage précédente en appuyant sur **⏮** pendant la lecture aléatoire.
- Il n'est pas possible de sélectionner la répétition d'une plage pendant la lecture aléatoire.

Lecture répétée → ⑤

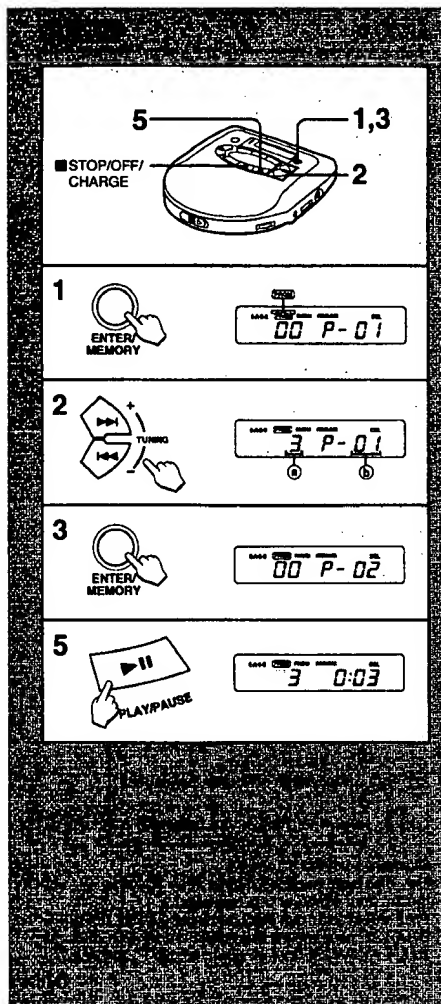
Appuyez sur **PLAY MODE** pendant la lecture pour sélectionner la lecture répétée de la façon suivante.



Signaux sonores

Des bips sont audibles quand vous appuyez sur une touche pour effectuer une opération.

Pour désactiver ces bips, appuyez sur **■ STOP/OFF/CHARGE** pour mettre l'appareil hors tension, puis sur **▶II PLAY/PAUSE** tout en appuyant sur **PLAY MODE**.



PROGRAM PLAY

English

Up to 24 tracks can be chosen for program play.

- 1 Press **ENTER/MEMORY** in standby mode to display **00**.
- 2 Select the desired track by pressing **I<<<** and **>>>I**.
 Ⓐ track number
 Ⓑ program number
- 3 Press **ENTER/MEMORY** within 8 seconds.
 If it is not pressed within 8 seconds, the track number changes to 00. Repeat the procedure from step 2 again.
- 4 Repeat steps 2 and 3 to program more tracks.
- 5 Press **>>II PLAY/PAUSE** to start program play.

To stop program play

Press **■ STOP/OFF/CHARGE**.

The total number of selected tracks and total playing time of the selected tracks appear.

To add tracks to the program

Repeat steps 2 and 3 before you proceed to step 5. You can add tracks to the end of the program.

To erase the program

Press **■ STOP/OFF/CHARGE** while in standby mode.

To check the programmed tracks

Press **ENTER/MEMORY** repeatedly before you proceed to step 5.

The number of each programmed track appears in order of playback.

Note

- The program is also erased when the disc compartment is opened or the auto power off function turns power off.
- When the 24 tracks are programmed, "P-FULL" appears, and no more tracks may be added.
- You cannot back to previous track by holding **I<<<** pressed during program play.
- Repeat play and random play can be performed during program play.

REPRODUCCION PROGRAMADA

Español

Se pueden seleccionar hasta 24 canciones para su reproducción programada.

- 1 Presione ENTER/MEMORY al modo de espera para que aparezca .
- 2 Seleccione la canción deseada presionando y .
- 3 Presione ENTER/MEMORY antes de 8 segundos. Si no se presiona antes de 8 segundos, el número de canción cambia a 00. Repita nuevamente el procedimiento desde el paso 2.
- 4 Repita los pasos 2 y 3 para programar canciones adicionales.
- 5 Presione PLAY/PAUSE para empezar la reproducción programada.

Para parar la reproducción programada

Presione STOP/OFF/CHARGE.

Aparecen el número total de canciones seleccionadas y el tiempo de reproducción total de las canciones seleccionadas.

Para agregar canciones al programa

Repita los pasos 2 y 3 antes de seguir con el paso 5. Se pueden agregar canciones al final del programa.

Para borrar el programa

Presione STOP/OFF/CHARGE en el modo de espera.

Para verificar las canciones programadas

Presione ENTER/MEMORY repetidamente antes de ir al paso 5.

El número de cada canción programada aparece en el orden de la reproducción.

Notas

- El programa también se borra cuando se abre el compartimiento del disco o cuando la función de desconexión automática desconecta el aparato.
- Cuando se han programado 24 canciones, aparece "P-FULL" y no pueden agregarse más canciones.
- No se puede volver a una canción anterior presionando durante la reproducción programada.
- Se puede usar la repetición de la reproducción o la reproducción aleatoria junto con la reproducción programada.

LECTURE PROGRAMMÉE

Français

En tout 24 plages peuvent être sélectionnées pour la lecture programmée.

- 1 Appuyez sur ENTER/MEMORY en mode de veille pour afficher .
- 2 Sélectionnez la plage souhaitée en appuyant sur et .
- 3 Appuyez sur ENTER/MEMORY en l'espace de 8 secondes. Si vous n'appuyez pas sur la touche en l'espace de 8 secondes, le numéro de plage reviendra à 00. Refaites les mêmes opérations à partir de l'étape 2.
- 4 Répétez les étapes 2 et 3 pour programmer d'autres plages.
- 5 Appuyez sur PLAY/PAUSE pour commencer la lecture programmée.

Pour arrêter la lecture programmée

Appuyez sur STOP/OFF/CHARGE.

Le nombre total de plages sélectionnées et le temps total de lecture des pistes sélectionnées s'affichent.

Pour ajouter des plages au programme

Répétez les étapes 2 et 3 avant de passer à l'étape 5. Vous pouvez ajouter des plages à la fin du programme.

Pour effacer le programme

Appuyez sur STOP/OFF/CHARGE en mode de veille.

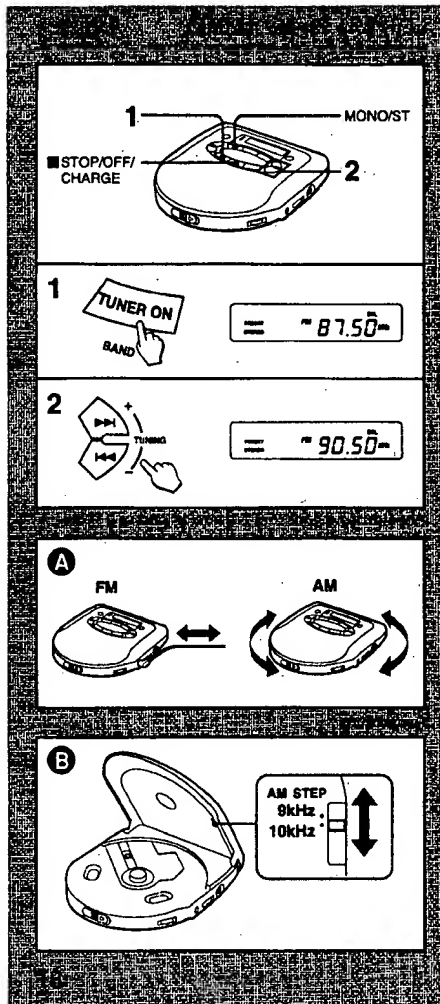
Pour contrôler les plages programmées

Appuyez plusieurs fois sur ENTER/MEMORY avant de passer à l'étape 5.

Le numéro de chaque plage programmée apparaît dans l'ordre de lecture.

Remarques

- Le programme est également supprimé à l'ouverture du volet du logement de disque, ou à la mise hors tension de l'appareil par la fonction de coupure automatique.
- Quand 24 plages sont programmées, "P-FULL" apparaît, et aucune autre plage ne peut être ajoutée.
- Vous ne pouvez pas revenir à la plage précédente en maintenant pressé pendant la lecture programmée.
- La lecture répétée et la lecture aléatoire sont possibles pendant la lecture programmée.



RADIO RECEPTION

English

Tuning in to a station

- 1 Press **TUNER ON/BAND** repeatedly to select AM or FM.
- 2 Press **TUNING + (▶▶)** or **— (◀◀)** to tune in to a station.

After listening, press **■ STOP/OFF/CHARGE** to turn off the radio.

For quick tuning

Keep either **TUNING + (▶▶)** or **— (◀◀)** pressed for about 1 second. When a station is tuned in to, the frequency stops automatically. However, it does not stop if the broadcast signal is weak.

For better reception → A

FM: The headphone cord functions as the FM antenna. Keep it extended.

AM: Turn the unit to find the position which gives the best reception.

To listen to an FM stereo broadcasting

When a tuned in station is in stereo, **STEREO** changes to **STEREO**.

When the FM stereo signal is weak and distorted, press **MONO/ST**. **STEREO** goes out and the sound will be heard in monaural but distortion will be reduced.

Note

- Do not open the disc compartment during radio reception. The buttons will be deactivated.
- The power is turned off automatically if no operation is made after 90 minutes from the last operation during radio reception.

AM steps → B

Radio broadcasts have different frequency ranges and changes in different steps in different countries.

This unit is factory-set to 10 kHz steps on AM. When using the unit where the AM step changes to 9 kHz, set the **AM STEP** switch on the inner side of the disc compartment to 9 kHz.

RECEPCION DE LA RADIO

Español

Sintonización de una emisora

- 1 Presione repetidamente TUNER ON/BAND para seleccionar AM o FM.
- 2 Presione TUNING + (▶▶) o - (◀◀) para sintonizar una emisora.

Después de escuchar, presione ■ STOP/OFF/CHARGE para desconectar la radio.

Para una sintonización rápida

Mantenga presionado TUNING + (▶▶) o - (◀◀) durante aprox. 1 segundo. Cuando se sintoniza una emisora, la frecuencia se detiene automáticamente. No se detendrá, sin embargo, si la señal transmitida es muy débil.

Para una mejor recepción → ④

FM: El cable del auricular funciona como antena de FM. Manténgala extendida.

AM: Gire el aparato hasta encontrar la posición que dé la mejor recepción.

Para escuchar transmisiones de FM estéreo

Cuando se sintoniza una emisora en estéreo, STEREO cambia a **STEREO**.

Cuando la señal FM estéreo es débil y se escucha distorsionada, presione MONO/ST. Se apaga STEREO y el sonido se escucha en monoaural pero se reduce la distorsión.

Notas

- No abra el compartimiento del disco durante la recepción de la radio. Se desactivarán los botones.
- Se desconecta automáticamente el aparato si no se hace ninguna operación después de 90 minutos de la última operación mientras escucha la radio.

Pasos de AM → ⑤

Las emisoras de radio tienen distintas gamas de frecuencia y cambia a distintos intervalos en diferentes países.

El aparato ha sido ajustado de fábrica a intervalos de 10 kHz en AM. Cuando utilice el aparato en lugares donde los intervalos de AM cambian a 9 kHz, mueva el interruptor AM STEP en el lado interior del compartimiento del disco a 9 kHz.

RÉCEPTION RADIO

Français

Accord d'une station

- 1 Appuyez de façon répétée sur TUNER ON/BAND pour sélectionner AM ou FM.
- 2 Appuyez sur TUNING + (▶▶) ou - (◀◀) pour accorder une station.

Après l'écoute, appuyez sur ■ STOP/OFF/CHARGE pour éteindre la radio.

Accord rapide

Maintenez TUNING + (▶▶) ou - (◀◀) pressé environ 1 seconde. À l'accord d'une station, la fréquence s'arrête automatiquement sauf si le signal d'émission est faible.

Pour améliorer la réception → ④

FM: Le cordon des écouteurs fait office d'antenne FM. Déployez-le pour écouter une émission FM.

AM: Tournez l'appareil pour trouver la meilleure position de réception.

Pour écouter une émission FM stéréo

Quand la station accordée est en stéréo, STEREO passe à **STEREO**.

Quand le signal FM stéréo est faible et déformé, appuyez sur MONO/ST. STEREO s'éteint, le son sera audible en monoaural, mais la distorsion sera réduite.

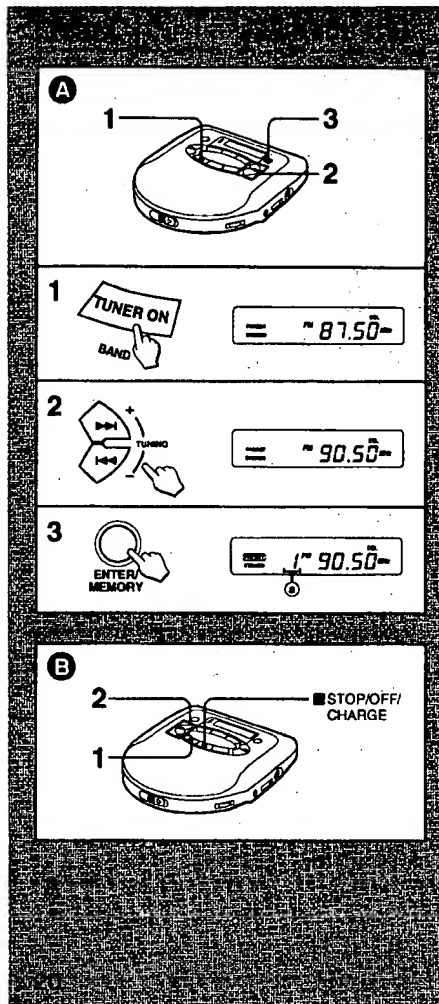
Remarques

- N'ouvrez pas le volet du logement de disque pendant la réception radio, sinon les touches seront désactivées.
- L'alimentation est automatiquement coupée si aucune opération n'est effectuée au cours des 90 minutes qui suivent la dernière opération, lors de la réception radio.

Intervalles d'accord AM → ⑤

Les plages de fréquences des émissions de radio et les intervalles d'accord varient d'un pays à l'autre.

Cet appareil est pré-réglé à l'usine à un intervalle d'accord de 10 kHz pour la gamme AM. Pour utiliser cet appareil dans un pays où l'intervalle d'accord est de 9 kHz, réglez le commutateur AM STEP à l'intérieur du logement de disque sur 9 kHz.



RADIO RECEPTION

English

Presetting stations → A

You can preset up to 30 stations on AM and FM.

- 1 Press TUNER ON/BAND repeatedly to select AM or FM.
 - 2 Press TUNING + (▶▶) or - (◀◀) to tune in to a station.
 - 3 Press ENTER/MEMORY to preset the station.
ⓐ Preset number
- To preset more stations, repeat steps 2 and 3.

Listening to preset stations → B

- 1 Press TUNER ON/BAND repeatedly to select AM or FM.
- 2 Press PRESET CALL ▲/▼ repeatedly to select the preset number.

After listening, press ■ STOP/OFF/CHARGE to turn off the radio.

Changing the presetting

- 1 Press PRESET CALL ▲/▼ repeatedly to select the preset number you wish to change.
 - 2 Keep ENTER/MEMORY pressed for 1 or more seconds until the preset number and the frequency flash.
 - 3 While the preset number is flashing, press TUNING + (▶▶) or - (◀◀) to tune in to a station.
 - 4 Press ENTER/MEMORY to preset the station on the selected preset number.
- If the flashing stops, repeat the procedure from step 2.

Erasing the presettings one by one

Press ENTER after step 2 in "Changing the presetting" above. Each preset Station is erased. All the settings move up by one and the preset numbers are refreshed.

Erasing all of the presetting

Press TUNER ON/BAND while pressing ENTER/MEMORY.

RECEPCION DE LA RADIO

Español

Programación de emisoras → A

Se puede programar hasta 30 emisoras en AM y FM.

- 1 Presione repetidamente **TUNER ON/BAND** para seleccionar AM o FM.
- 2 Presione **TUNING + (▶▶)** o **-(◀◀)** para sintonizar una emisora.
- 3 Presione **ENTER/MEMORY** para dejar la emisora programada.

ⓐ Número de programa

Para programar emisoras adicionales, repita los pasos 2 y 3.

Para escuchar emisoras programadas → B

- 1 Presione repetidamente **TUNER ON/BAND** para seleccionar AM o FM.
- 2 Presione repetidamente **PRESET CALL ▲/▼** para seleccionar el número de programa.

Después de escuchar, presione ■ **STOP/OFF/CHARGE** para desconectar la radio.

Cambio de la programación

- 1 Presione repetidamente **PRESET CALL ▲/▼** para seleccionar el número de programa que desea cambiar.
- 2 Mantenga presionado **ENTER/MEMORY** durante 1 segundo o más hasta que el número de programa y la frecuencia destellen.
- 3 Mientras destella el número de programa, presione **TUNING + (▶▶)** o **-(◀◀)** para sintonizar una emisora.
- 4 Presionado **ENTER/MEMORY** para programar la emisora en el número de programa seleccionado. Si deja de destellar, repita el procedimiento desde el paso 2.

Borrado de las programaciones una a una
Presione **ENTER** después del paso 2 de "Cambio de la programación" anterior. Cada emisora programada se borra. Todos los ajustes se mueven en una unidad y los números de programa se renuevan.

Borrado de toda la programación

Presione **TUNER ON/BAND** mientras presiona **ENTER/MEMORY**.

RÉCEPTION RADIO

Français

Préréglage des stations → A

Vous pouvez préréglager en tout 30 stations sur les gammes AM et FM.

- 1 Appuyez de façon répétée sur **TUNER ON/BAND** pour sélectionner AM ou FM.
- 2 Appuyez sur **TUNING + (▶▶)** ou **-(◀◀)** pour accorder une station.
- 3 Appuyez sur **ENTER/MEMORY** pour préréglager la station.

ⓐ Numéro de préréglage

Pour préréglager d'autres stations, répétez les étapes 2 et 3.

Ecoute des stations préréglées → B

- 1 Appuyez de façon répétée sur **TUNER ON/BAND** pour sélectionner AM ou FM.
- 2 Appuyez de façon répétée sur **PRESET CALL ▲/▼** pour sélectionner le numéro de préréglage.

Après l'écoute, appuyez sur ■ **STOP/OFF/CHARGE** pour éteindre la radio.

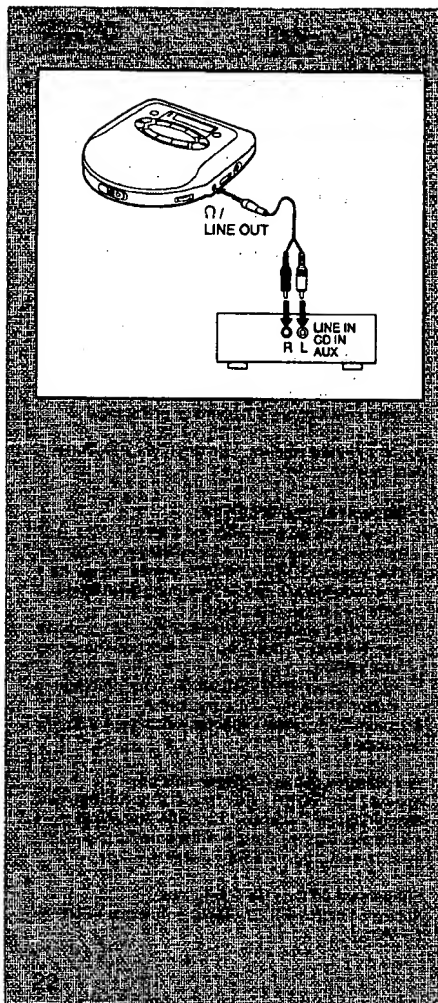
Changement de préréglage

- 1 Appuyez de façon répétée sur **PRESET CALL ▲/▼** pour sélectionner le numéro de préréglage à changer.
- 2 Maintenez **ENTER/MEMORY** pressé au moins 1 seconde jusqu'à ce que le numéro de préréglage et la fréquence clignotent.
- 3 Quand le numéro de préréglage clignote, appuyez sur **TUNING + (▶▶)** ou **-(◀◀)** pour accorder une station.
- 4 Appuyez sur **ENTER/MEMORY** pour préréglager la station sur le numéro sélectionné. Si le numéro cesse de clignoter, recommencez à partir de l'étape 2.

Suppression des préréglages un à un
Appuyez sur **ENTER** après l'étape 2 de "Changement de préréglage" ci-dessus. La station préréglée sera supprimée. Tous les réglages augmenteront d'une unité et les numéros de préréglage seront rafraîchis.

Effacement de tous les préréglages

Appuyez sur **TUNER ON/BAND** en pressant **ENTER/MEMORY**.



CONNECTING AN EXTERNAL UNIT English

Use a commercially available connection cord which has a 3.5 σ stereo mini-plug at one end and two phono plugs at the other end.

Connect the stereo mini-plug to the Ω /LINE OUT jack of the unit and connect the phono plugs to the analog input terminals of the external unit.

Note

- Turn off the power of both units before connection.
- DO NOT connect to the PHONO inputs of an amplifier (with a built-in phonoequalizer-amplifier).
- Adjust the volume and DSL on this unit.

CONEXION DE UNA UNIDAD EXTERNA

Español

Utilice un cable de conexión en venta en los comercios, con un minienchufe estéreo de 3,5 e en una punta y dos enchufes fonográficos en la otra punta.
Conecte el minienchufe estéreo en la toma de salida Ω /LINE OUT del aparato y conecte los enchufes fonocaptóres en los terminales de entrada analógicos de la unidad externa.

Notas

- Desconecte ambos aparatos antes de hacer esta conexión.
- NO conecte las entradas PHONO de un amplificador (con un amplificador fonocualizador incorporado).
- Ajuste el volumen y el DSL de este aparato.

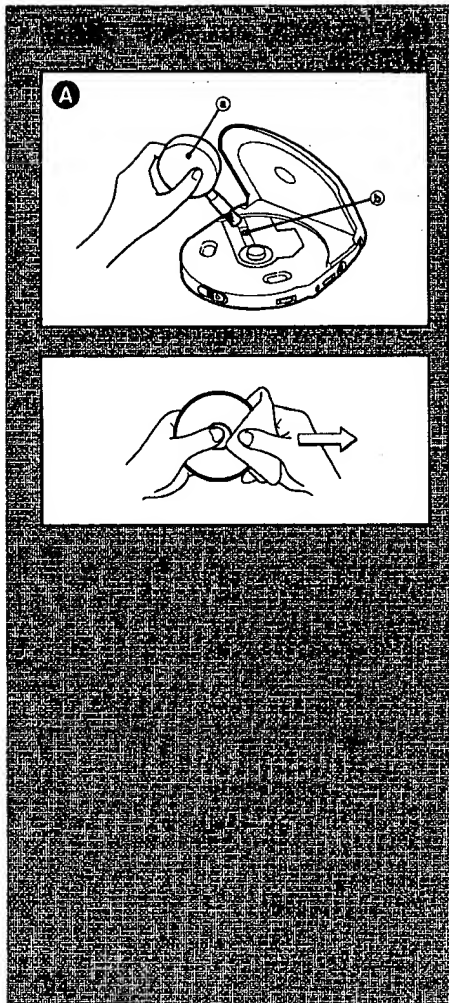
RACCORDEMENT À UN AUTRE APPAREIL

Français

Utilisez un cordon de liaison à minifiche stéréo 3,5 e mm à une extrémité et deux fiches cinch à l'autre en vente dans le commerce.
Raccordez le minifiche stéréo à la prise Ω /LINE OUT de l'appareil et les fiches cinch aux prises d'entrée analogiques de l'autre appareil.

Remarques

- Eteignez les deux appareils avant de les relier.
- NE RACCORDEZ PAS le cordon aux entrées PHONO d'un amplificateur (en cas d'amplificateur-égaliseur phono intégré).
- Ajustez le volume et la fonction DSL sur l'appareil.



MAINTENANCE

English

To clean the lens → A

If the lens becomes dirty, the player will skip or not play. If this occurs, clean the lens in the following manner.

To remove dust or dry particles, first use a camera lens blower/brush ① to blow a few times to loosen particles, then gently brush the lens ② clean. Finish by blowing the lens again.

To remove fingerprints, use a cotton swab dipped in lens cleaning solution. Wipe gently from the center to the edge. Lens cleaning solution is commercially available.

Note

Take care not to get too much solution on the swab, which could flow into the unit and cause damage.

Pressing too strongly with the swab could scratch or break the lens.

To clean the discs → B

Before playing, wipe the disc from the center outward with a cleaning cloth. After playing, store the disc in its case.

MANTENIMIENTO

Español

Para limpiar la lente → A

Cuando la lente está sucia el reproductor saltará o no podrá reproducir. En este caso limpie la lente de la siguiente forma.

Para eliminar el polvo o partículas secas, utilice primero un cepillo/soplador de lente de cámara fotográfica ④ para soplar las partículas finas y cepille suavemente la lente ⑥ para limpiar. Termine soplando nuevamente sobre la lente.

Para eliminar las huellas dactilares, utilice un palillo cubierto con un algodón empapado con una solución de limpieza de lentes. Frote suavemente empezando por el centro y hasta los bordes. Hay soluciones de limpieza de lentes en venta en los comercios.

Nota

No moje excesivamente el algodón porque puede gotear hacia el interior del aparato y dañarlo.

No presione con fuerza con el algodón porque puede rayar o romper la lente.

Para limpiar los discos → B

Antes de reproducir, frote el disco desde el centro hacia afuera con un paño de limpieza. Después de reproducir, guarde el disco en su caja.

ENTRETIEN

Français

Pour nettoyer la lentille → A

Si la lentille est sale, le son sera coupé ou le lecteur ne fonctionnera pas.

Le cas échéant, nettoyez la lentille de la façon suivante. Pour enlever la poussière et les particules sèches, utilisez d'abord une brosse-soufflet pour objectif d'appareil photo ④ et soufflez plusieurs fois de suite pour détacher les particules. Brossez ensuite légèrement la lentille ⑥ pour la nettoyer. Soufflez une dernière fois sur la lentille pour disperser la saleté.

Pour enlever les traces de doigts, utilisez de l'ouate imprégnée d'un liquide de nettoyage. Essuyez légèrement la lentille du centre vers le bord. Vous trouverez des liquides de nettoyage spéciaux dans le commerce.

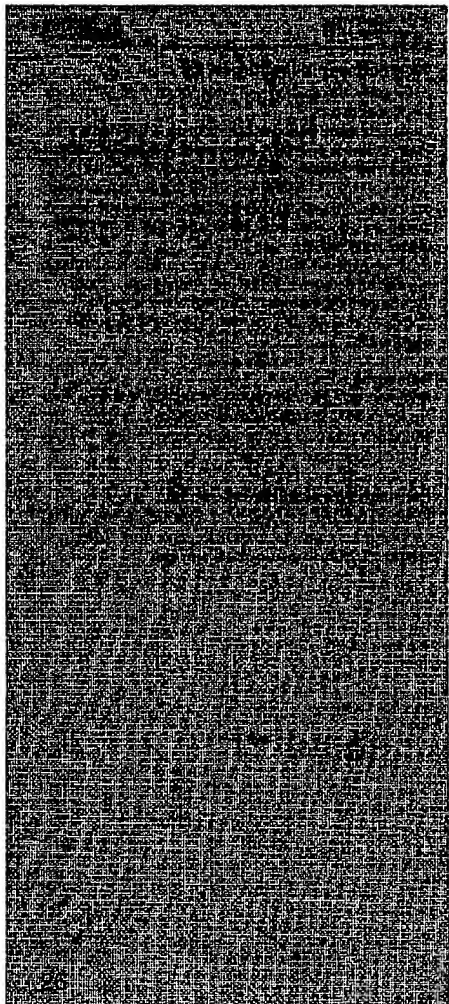
Remarque

N'imprégnez pas trop l'ouate de liquide, car il pourrait couler dans l'appareil et l'endommager.

Ne frottez pas trop fort la lentille avec l'ouate, car elle pourrait être rayée ou brisée.

Pour nettoyer les disques → B

Avant la lecture, essuyez le disque du centre vers la périphérie avec un chiffon de nettoyage. Après la lecture, rangez toujours le disque dans son étui.



SPECIFICATIONS

English

Tracking system	1-beam laser
Laser pickup	Semiconductor laser
D/A conversion	8-times oversampling digital filter + 1-bit DAC
Frequency response	20 – 20,000 Hz
Output	LINE OUT jack (stereo mini-jack)
Frequency range	AM: 530/531 kHz – 1,710/1,602 kHz (10 kHz/9 kHz steps) FM: 87.5 – 108 MHz
Maximum output	12 mW + 12 mW (EIAJ 16 ohms at 1 kHz) 500 mV (47 k ohms at 1 kHz)
Power supply	DC 3 V using two size AA (LR6) alkaline batteries DC 2.4 V using two commercially available (Ni-Cd 1.2 V 700 mAh) rechargeable batteries AC house current using the supplied AC adaptor
Dimensions	132 (W) x 30 (H) x 143.6 (D) mm (5 1/4 x 1 3/16 x 5 3/4 in.)
Weight	Approx. 250 g (8.8 oz.) excluding batteries
Accessories	AC adaptor AC-A62 (1) Stereo headphones (1)
AC adaptor AC-A62	Rated voltage: AC-120 V, 60 Hz

The specifications and external appearance of this unit are subject to change without notice.

ESPECIFICACIONES

Español

Sistema de seguimiento	1 rayo láser
Receptor del láser	Láser semiconductor
Conversión D/A	Filtro digital con sobremuestreo de 8 veces + DAC de 1 bit
Respuesta de frecuencia	20 – 20.000 Hz
Salida	Toma ϕ /LINE OUT (minitoma estéreo)
Gama de frecuencias	AM: 530/531 kHz – 1.710/1.602 kHz (intervalos de 10 kHz/9 kHz) FM: 87,5 – 108 MHz
Salida máxima	12 mW + 12 mW (EIAJ de 16 ohmios a 1 kHz) 500 mV (47 k ohmios a 1 kHz)
Alimentación eléctrica	CC de 3 V utilizando dos pilas alcalinas de tamaño AA (LR6) CC de 2,4 V utilizando dos baterías recargables de venta en los comercios (Ni-Cd 1,2 V 700 mAh) CA del hogar utilizando el adaptador de CA suministrado
Dimensiones	132 (An.) x 30 (Al.) x 143,6 (Prof.) mm
Peso	Aprox. 250 g sin pilas
Accesorios	Adaptador de CA AC-A62 (1) Auriculares estéreo (1)
Adaptador de CA AC-A62	Voltaje nominal: CA de 120 V, 60 Hz

Las especificaciones y aspecto exterior de este aparato están sujetos a cambios sin previo aviso.

SPÉCIFICATIONS

Français

Système de lecture	Laser à 1 faisceau
Dispositif de lecture	Laser semi-conducteur
Conversion n-a	Filtre numérique de suréchantillonnage 8 fois + DAC 1 bit
Réponse en fréquence	20 – 20 000 Hz
Sortie	Prise ϕ /LINE OUT (minifiche stéréo)
Plage de fréquences	AM: 530/531 kHz – 1 710/1 602 kHz (intervalle de 10 kHz/9 kHz) FM: 87,5 – 108 MHz
Puissance maximale	12 mW + 12 mW (EIAJ 16 ohms à 1 kHz) 500 mV (47 k ohms à 1 kHz)
Alimentation	3 V c.c. avec deux piles alcalines format AA (LR6) 2,4 V c.c. avec deux piles rechargeables (Ni-Cd 1,2 V 700 mAh) en vente dans le commerce Secteur domestique avec l'adaptateur secteur fourni
Dimensions	132 (L) x 30 (H) x 143,6 (P) mm
Poids	Environ 250 g sans les piles
Accessoires	Adaptateur secteur AC-A62 (1) Ecouteurs stéréo (1)
Adaptateur secteur AC-A62	Tension nominale: Secteur 120 V, 60 Hz

La conception et les spécifications peuvent être modifiées sans préavis.

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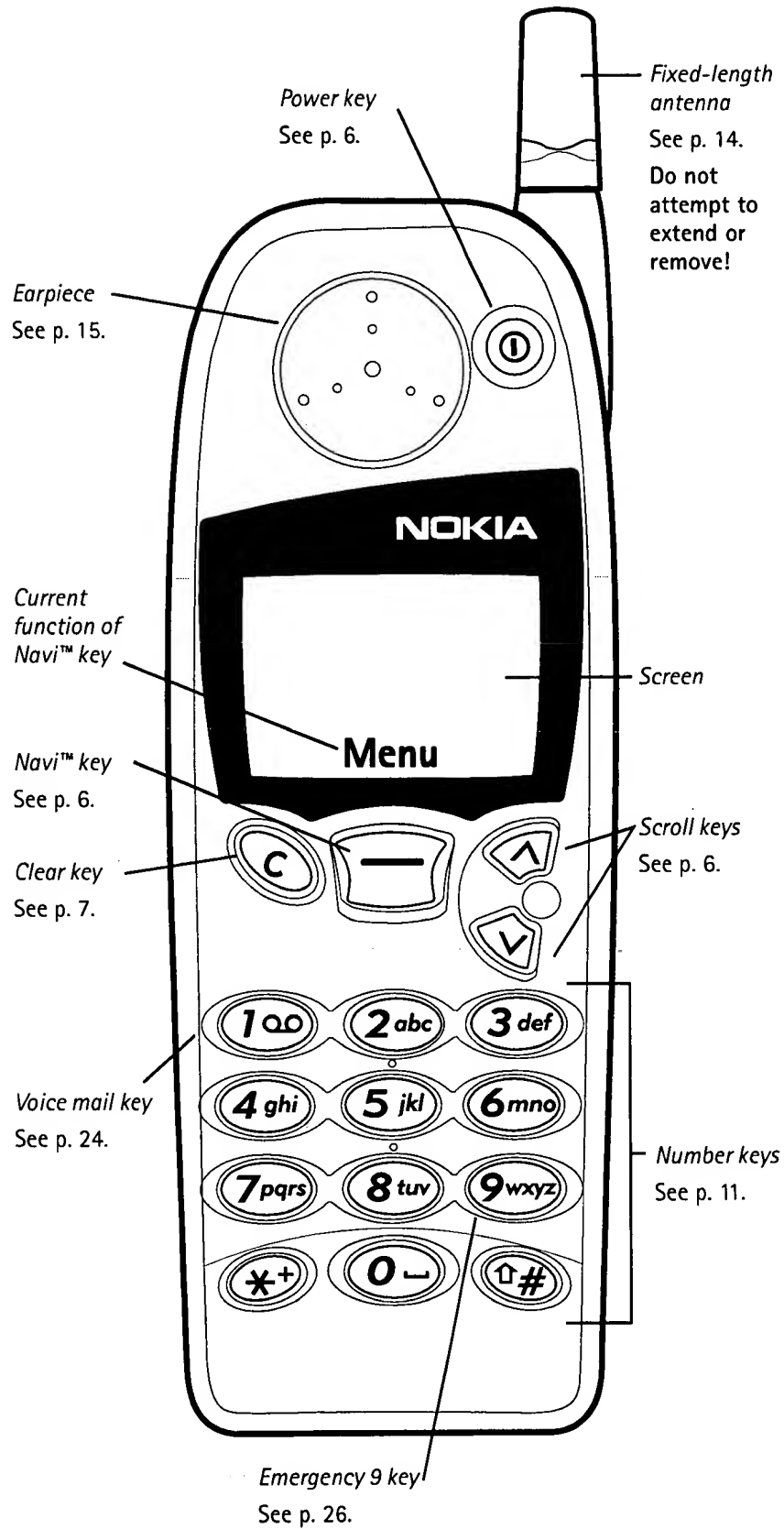
NOKIA
CONNECTING PEOPLE



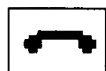
**OWNER'S
MANUAL**

NOKIA
5160/5160i

Keys



Indicators and icons



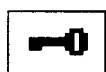
You have an active call.



You have one or more new voice messages.



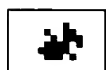
You have one or more new text messages.



Keyguard is on. Your phone will not accept any keypresses. To turn it off, press **Unlock**, then ***+**.



The alarm clock is set.



The ringing option is set to **Silent**.



Digital service is available.



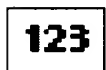
The phone is ready for you to enter a response.



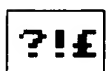
Characters entered will be upper-case letters. Press the ***#** key to switch letter case.



Characters entered will be lower-case letters. Press the ***#** key to switch letter case.



Characters entered will be numbers. (When entering letters, switch to numbers by pressing and holding the ***#** key.)



You are in "special character" mode; select a character, then press **Use**. (When entering letters, switch to special characters by pressing the ***+** key.)

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1. For your safety



Read these simple guidelines before using your phone. Failure to comply with these guidelines may be dangerous or illegal.



Road Safety Comes First

Don't use a hand-held phone while driving; park the vehicle first.



Switch Off In Hospitals

Follow any regulations or rules. Switch phone off near medical equipment.



Switch Off On Aircraft

Wireless phones can cause interference. Using them on aircraft is illegal.



Switch Off When Refueling

Don't use phone at a refueling point. Don't use near fuel or chemicals.



Switch Off Near Blasting

Do not use the phone where blasting is in progress. Observe restrictions, and follow any regulations or rules.



Interference

All wireless phones may get interference which could affect performance.



Use Sensibly

Use only in the normal position (to ear). Don't touch the antenna unnecessarily.



Qualified Service

Only qualified service personnel must install or repair equipment.



Accessories and Batteries

Use only approved accessories and batteries. Do not connect incompatible products.

FCC/Industry Canada Notice

Your phone may cause TV or radio interference (for example, when using a telephone in close proximity to receiving equipment). The FCC or Industry Canada can require you to stop using your telephone if such interference cannot be eliminated. If you require assistance, contact your local service facility.

This device complies with part 15 of the FCC rules. Operation is subject to the condition that this device does not cause harmful interference.

Using this Guide

The wireless phone described in this guide is approved for use in TDMA and AMPS networks.

Network services

A number of features included in this guide are called network services. They are special services provided by wireless service providers. Before you can take advantage of any of these network services, you must subscribe to the service(s) from your home service provider and obtain instructions for their use.

Updates

The latest version of this Owner's Manual may be found on Nokia's World Wide Web site at **www.nokia.com**.

Interactive manual

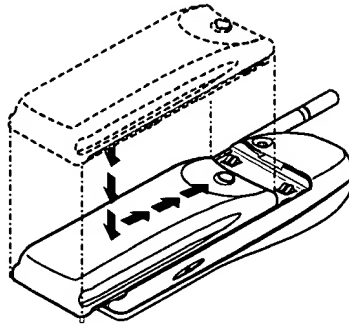
Now, Nokia has a great new way for you to learn how to use all of your phone features. Go to **www.nokiahowto.com** to access the Nokia Interactive Owner's Manual. It provides an interactive way to get step-by-step instructions for any of your phone's features.

2. Battery installation and charging

Before you can use your new phone, you need to attach and charge the battery.

Attaching the battery

To attach the battery, place it on the back of the phone as shown and slide it toward the top of the phone until it clicks into place.



Battery charging

Your phone is powered by a rechargeable NiMH or Li-Ion battery. Note that a new NiMH battery's full performance is achieved only after two or three complete charge and discharge cycles. For charging times, see 'Charging times' on page 57.

How to charge your battery

Connect the lead from the charger to the bottom of your phone or to a charging stand. Then plug the charger into a standard wall outlet.

When the battery is charging, the battery strength indicator on the right side of the display scrolls.

Note: When you charge the battery for the first time, the battery strength indicator will not scroll the entire time; this is normal.

Problems charging

If your phone displays **Not charging**, charging is suspended. Check that the battery is connected to an approved charging device. If the battery is very hot or cold, wait for a while;

charging will automatically resume after the battery is restored to its normal operating state. If charging still fails, contact your dealer.

When is charging complete?

When the charge indicators stop scrolling, your phone is considered fully charged. However, a slight increase in charge may occur if you leave your phone connected to the charger.



When is a good time to charge?

You can charge anytime, but remember that when your phone displays **Battery low**, you only have a couple of minutes of talk time left.

Can I make calls while charging?

Yes, but depending on the charger used, your battery may not charge during a call.

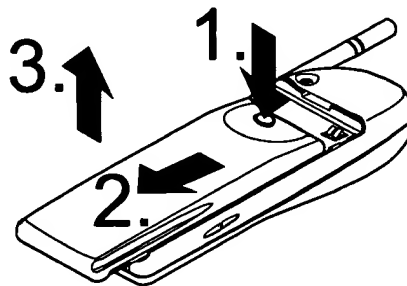
Discharging NiMH batteries

For good operation times, discharge NiMH batteries from time to time by leaving your phone switched on until it turns itself off (or by using the battery discharge facility of any approved accessory available for your phone). Do not attempt to discharge the battery by any other means.

Removing the battery

Note: Switch off the phone before removing the battery!

- 1 Press and hold the button at the top of the battery.
- 2 Slide the battery toward the bottom of the phone.
- 3 Lift the battery off the phone.




Important battery information

- Note that a new battery's full performance is achieved only after two or three complete charge and discharge cycles!
- The battery can be charged and discharged hundreds of times but it will eventually wear out. When the operating time (talk time and standby time) is noticeably shorter than normal, it is time to buy a new battery.
- Use only batteries approved by the phone manufacturer and recharge your battery only with the chargers approved by the manufacturer.
- When a charger is not in use, disconnect it from the power source. Do not leave the battery connected to a charger for longer than a week, since overcharging may shorten its life. If left unused a fully charged battery will discharge itself over time.
- (NiMH batteries only) For good operation times, discharge the battery from time to time by leaving your phone switched on until it turns itself off (or by using the battery discharge facility of any approved accessory available for your phone). Do not attempt to discharge the battery by any other means.
- Temperature extremes will affect the ability of your battery to charge: allow it to cool down or warm up first.
- Use the battery only for its intended purpose.
- Never use any charger or battery which is damaged or worn out.
- Do not short circuit the battery. Accidental short circuiting can occur when a metallic object (coin, clip, or pen) causes direct connection of the + and - terminals of the battery (metal strips on the back of the battery), for example when you carry a spare battery in your pocket or purse. Short circuiting the terminals may damage the battery or the connecting object.
- Leaving the battery in hot or cold places, such as in a closed car in summer or winter conditions, will reduce the capacity and lifetime of the battery. Always try to keep the battery between 59° F and 77° F (15° C and 25° C). A phone with a hot or cold battery may temporarily not work, even when the battery is fully charged. NiMH batteries' performance is particularly limited in temperatures below 14° F (-10° C). Li-Ion batteries' performance is particularly limited in temperatures below 32° F (0° C).
- Do not dispose of batteries in a fire!
- Dispose of used batteries in accordance with any local regulations.


3. About the phone, keys and menu

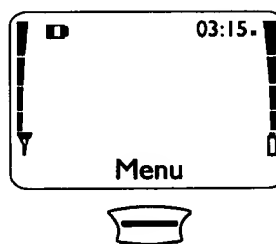
Power key

You can use the power key  to:

- turn the phone on or off (*press and hold*)
- turn the phone's lights on for 15 seconds
- select a quick alert setting (see page 23) (if Keyguard is off and the phone is not connected to a headset or handsfree car kit)
- silence the ringing of an incoming call



Nokia Navi™ key



Your phone's Navi™ key  appears below the display. Its current function is indicated by the word that appears above it (for example, **Menu**). Simply press the Navi™ key to perform the function.




Throughout this guide, when you see "press **Menu**," "press **Listen**," etc., press the Navi™ key when that word appears above it.

Scroll keys

The scroll keys   are located to the right of the Navi™ key. Use the scroll keys to:

- browse menus
- move the cursor (see page 11) to the right or the left
- adjust the earpiece volume while in a call
- access your phone book (press  from the start screen)
- access the dialed calls list (press  from the start screen)


Clear key

Use the clear key  to:

- delete a character to the left of the cursor
- clear all characters from the display (press and hold)
- return to the previous menu level
- return from the menu to the start screen (press and hold)
- access the in-call menu while in a call

Lights

To turn your phone's lights on for 15 seconds:

- if Keyguard is off, press any key
- if Keyguard is on, you must press the  key briefly (this conserves battery power by keeping the lights from turning on when the phone is in a pocket or purse)

For information about controlling your phone's lights when the phone is in a car kit, see page 21.

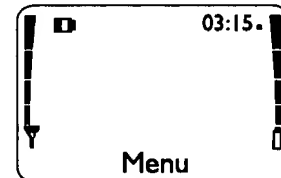
External antenna jack



At the back of the phone, below the antenna, there is a connector for an external antenna. The connector may be protected by a rubber cap. Remove the cap before connecting an external antenna. After removing the antenna, replace the cap.

Note: Keep the cap out of the reach of small children.

Start screen

The start screen appears when you first turn on your phone. **Menu** appears above the Navi™ key so you can access your phone's menu. Several features can be used only when the phone is at the start screen.



To get to the start screen, press and hold  for a second. (If there are characters on the display this clears the characters, then you must press and hold  again.)



Menu

Your phone's menu allows you to easily access the many powerful features in your phone.




Scroll bar

When you use your phone's menu, a scroll bar appears at the far right of the screen. This bar indicates where you are in the menu; each tab location on the bar represents a different menu item.



For example, press **Menu** once. The scroll bar appears with the first (top) tab displayed. A different tab appears each time you press one of the scroll keys  .

Help text

Many menu items have brief help text. To view the help text, scroll to the menu item and wait for about 10 seconds for the text to appear. Press **More** or  to see the next page of text,  to see the previous page, or  to return to the menu.

Menu shortcuts

When you select a menu item, numbers appear on the display above the scroll bar. If you become familiar with these numbers, you can use them as shortcuts for accessing different menu items. For example, to access the **Phone settings** menu, you can simply press **Menu 4 2**. The phone displays the first item in that menu, **Touch tones**.



Note: (1) Menu items in your phone vary depending on the network and accessories used. (2) This is not a complete list; see entries about individual features for more information.

1 Phone book

- 11 Search
- 12 Add new
- 13 Edit
- 14 Erase
 - 141 One by one
 - 142 Erase all
- 15 Options
 - 151 Scrolling view
 - 152 Memory status
- 16 1-touch dialing

2 Messages

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Entering letters and numbers



Cursor

The cursor is a blinking vertical line that appears on the screen when you are entering text or numbers. Characters you enter appear to the right of the cursor. Pressing the  key deletes the character to the left of the cursor. Use the scroll keys to move the cursor to the right  or left .


ABC mode

When your phone is ready for you to enter text, such as a name or message, it switches to ABC mode. The **ABC** icon shows that it is in ABC mode.

When **ABC** is displayed, you can enter these characters by pressing the indicated key repeatedly:


Key	Characters	Key	Characters
1	. , ' ? ! - 1	7	PQRS7
2	ABC2	8	TUV8
3	DEF3	9	WXYZ9
4	GHI4	0	space, 0
5	JKL5		See 'Special characters in names' on page 12.
6	MNO6		Changes letter case, switches between letters and numbers

Changing letter case




Press the  key to switch between upper- and lower-case letters. The **ABC** icon switches to **abc** to indicate that you are using lower case.

Entering numbers

To enter numbers while in ABC mode, you can:


- press and hold the corresponding key until the number appears, or
- switch between ABC mode and number mode by pressing and holding the  key.

Special characters in names


In ABC mode you can press the  key to view the special characters below. You can use these characters when saving names in your phone book. Simply press  or  to highlight the one you want, then press **Use**.

. , ? ! : ; - + # * () ' " _ @ & \$ % / < > ¿ i =



Tip: To choose a character that appears near the end of the list, immediately press  to go to the end of the list.

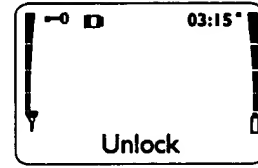
Special characters in phone numbers

You can use special characters to dial or save phone numbers of automated services such as bank account information. When entering numbers, press the  key repeatedly until you see the character you want.

Character	Use
*	This character is used to request services from the network. Contact your service provider for details.
+	This character is not currently used.
p	<p>This character creates a pause. Digits to the right of the p are sent as touch tones after a 2.5-second pause.</p> <p>Use this character to save phone numbers of automated services that require you to enter a password or other information after the call is answered. For example, if your voice mail number at work is 555-1212 and you need to enter your extension (1234) and then a password (5678) in order to listen to your messages, you could save this phone number as 5551212p1234p5678.</p>
w	This character creates a wait . It works similarly to the pause character except that digits to the right of the w are not sent until you press Send .

Keyguard (locking the keypad)

The Keyguard feature allows you to "lock" your phone's keypad so that accidental keypresses have no effect. This is handy when your phone is in a pocket or purse.



Note: Keyguard is not a security feature and will not prevent unauthorized use of your phone.

To lock the keys

Press **Menu 9** or **Menu** (*+).

To unlock the keys

Press **Unlock** (*+).

Notes about Keyguard

- When Keyguard is on, the only way to answer a call is to press **Answer**.
- When Keyguard is on, calls may be possible to the emergency number programmed into your phone (e.g. 911 or other official emergency number). However, one-touch emergency dialing ('emergency key 9') does not operate.
- Keyguard is automatically turned off when the phone is connected to a car kit.

4. Basic functions

Turning the phone on or off

Press and hold the  key for one second.

Note: If the phone asks for a lock code, see 'Lock code' on page 51. If the phone asks for a security code, see 'Security code' on page 51.

WARNING! Do not switch on the phone when wireless phone use is prohibited or when it may cause interference or danger.

About the antenna

Your Nokia phone has a fixed-length antenna. Do not attempt to extend or remove it.

Normal position

Hold the phone as you would any other telephone, with the antenna pointed up and over your shoulder.

Tips on efficient operation

As with any other radio transmitting device, do not touch the antenna unnecessarily when the phone is switched on. Contact with the antenna affects call quality and may cause the phone to operate at a higher power level than otherwise needed.

Checking signal strength

Your phone operates on radio waves. Radio signal coverage is maintained by a wireless network, and the quality of calls on your phone depends on the strength of the wireless radio signal.

Get a strong signal

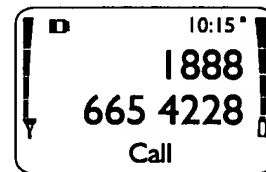
When you are at the start screen (see page 7) or in a call, the strength of the radio signal is indicated by the signal indicators on the left side of your phone's display. These indicators scroll as the signal strength increases and decreases.





To improve your phone's reception, try moving your phone slightly. If you're inside a building, move toward a window.

Making a call



- 1 Enter the area code and phone number. (**Menu** changes to **Call**.)
- 2 Press **Call** and wait for the other party to answer.



Volume adjustment (earpiece)

To adjust the earpiece volume, press  or  during a call. If an accessory with its own loudspeaker is connected to your phone, the scroll keys will adjust the volume for that accessory.

Muting the microphone

When you are in a call, you can mute the phone's microphone by pressing , pressing **Options**, and selecting **Mute**. To unmute the microphone, press , press **Options**, and select **Unmute**.


Note: For more information about the in-call menu, see page 28.

Ending a call

Press **End**.

Last number redial


The last 10 numbers you dialed are stored in the dialed calls list. Use this list to redial a number you have called recently.

- 1 From the start screen, press  to access the dialed calls list.
- 2 Scroll to the desired number.
- 3 Press **Call**.

Saving a name and number


See 'Saving names and numbers' on page 36.

Finding a name and number

- 1 Press  to access your phone book.
- 2 Scroll to the number you want. (To skip ahead quickly in the list, press the number key that corresponds to the first letter of the name.)
- 3 Press **Call**.

For other ways to find names and numbers, see 'Finding names and numbers' on page 37.

Answering a call

When someone calls, the phone will alert you (see 'Tones' on page 21) and **Call** will flash on the display. To answer the call, press any key except .

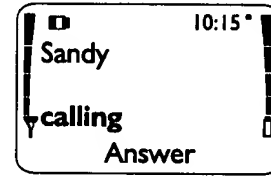
Note: To prevent accidental answering when the phone is in a pocket or purse, the phone will not answer the call if you press the key for longer than one second.

For information on setting your phone to answer incoming calls automatically, see 'Automatic answer' on page 34.

Caller ID


Caller ID is a network service that can display the name and phone number of the person calling you, if the information is available. Contact your service provider for details.

If the caller can be identified, the phone may display the caller's name and phone number. The information displayed depends on the information available through the network and your phone book. It is possible that only the name or the number will appear.



Call – caller ID unavailable will display when the wireless network does not recognize the calling number. Also, **Call – caller ID blocked** may display if the calling party has blocked caller ID.

Silencing an incoming call

To silence the ringing of an incoming call, press  briefly.

5. Settings

This section describes some phone settings that allow you to customize your phone to suit your preferences and that you probably won't change very often.

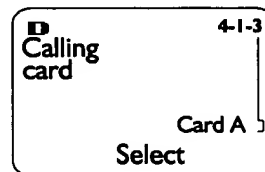
Automatic redial

Use **Menu 4 1 2** to turn this feature on or off. When this feature is on and the wireless network is busy, your phone will redial a number up to three times. This feature will not redial to a busy phone number.

To stop the call attempts, press **Quit** or .


Calling card set-up

If you wish to use a calling card for long distance calls, you must first save your calling card information into your phone. Your phone can save information about two calling cards.




To learn how to make calling card calls, see 'Calling card calls' on page 33.

Saving calling card information

- 1 Press **Menu 4 1 3**.
- 2 Scroll to the desired calling card, then press **Options**.
- 3 Scroll to **Edit**, then press **OK**.
- 4 Enter your security code (see page 51), then press **OK**.
- 5 At **Dialing sequence**, press **Select**. Press  to choose the dialing sequence your card uses, then press **Select**.

Dialing sequence	Use for cards that require you to:	Cards using this sequence
Access no. + phone no. + card no.	Dial 1-800 access number, then phone number, then card number (+ PIN if required)	MCI, AT&T True Choice, Sprint Canada, Unitel
Access no. + card no. + phone no.	Dial 1-800 access number, then card number (+ PIN if required), then phone number	networkMCI, WorldPhone MCI
Prefix + phone no. + card no.	Dial the prefix (any numbers that must precede the phone number) and phone number you want to dial, then card number (+ PIN if required)	GTE, PacBell, AT&T, Stentor

Note: The order of the following steps may vary, depending on which dialing sequence your card uses.

- 6 Enter access number (usually the 1-800 number listed on the back of the calling card), then press **OK**.
- 7 Enter your card number and/or PIN, then press **OK**. Your phone will display **Save changes?** Press **OK**.
- 8 Press  to reach **Card name**, then press **Select**. Enter the card name using your phone's keypad, then press **OK**.

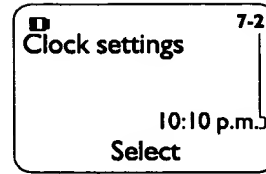
Note: This procedure might not work with all calling cards. Please look at the back of your calling card or contact your long distance company for more information.

Choosing a calling card to use

To select a calling card to use, press **Menu 4 1 3**, scroll to the card you want, then press **Options**. **Select** is highlighted; press **OK**. Enter your security code, then press **OK**.

Clock

Your phone has an internal clock that can be displayed on the start screen. The clock must be set in order for call times to be recorded (see 'Call log' on page 39).




If you remove the battery for longer than a couple of seconds, the time will be lost. The next time you turn on the phone, you will be asked to enter the time.

Selecting time format

Use **Menu 7 2 3** to set the clock's format to **24-hour** or **am/pm**.

Setting the time

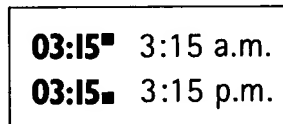
Use **Menu 7 2 2** to enter the current time. Use two digits for both hours and minutes (for example, enter 1:30 as **0130**). If the clock's time format is set to **am/pm**, you will be asked to choose **am** or **pm**.

Note: The  key does not work on this screen. If you make a mistake, re-enter all four digits.

Displaying or hiding the clock

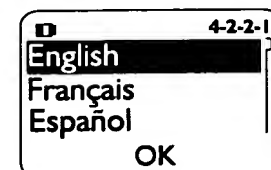
Press **Menu 7 2 1** to display the clock on the phone's screen if it is currently hidden, or vice versa.

When the clock is displayed and the time format is set to **am/pm**, a black square will appear next to the time indicating a.m. or p.m.



Language

Use **Menu 4 2 2** to set the language of your phone's display. You can choose from English, French, Spanish, and Portuguese.



The shortcut for choosing English is to press **Menu 4 2 2 1**.

Lights

If you're using your phone with a car kit, use **Menu 4 2 4** to set your phone's lights to **On** (lights stay on) or **Automatic** (after 15 seconds, lights turn off until the next key is pressed, phone rings, etc.).

For information about turning your phone's lights on at any time, see page 7.

Tones

Use Menu 8, My tones, to change the six sound settings in your phone: ringing option, ringing tone, ringing volume, message alert tone, keypad tones, and warning and game tones.

The quick alert settings feature (see page 23) allows you to select a fixed combination of these settings to suit your current environment.

Ringing option

Use **Menu 8 1** to tell your phone how to notify you that you have a call.


Note: If you choose **Beep once** or **Silent**, the alarm clock will only sound a quiet beep.

Ring The phone rings normally using the currently selected ringing tone.

Ascending The phone rings using the currently selected ringing tone. The ringing volume starts low and increases with successive rings.

Ring once The phone rings once using the currently selected ringing tone.

Beep once The phone beeps once.

Silent The phone makes no sound when you receive a call. The  icon appears at the start screen.

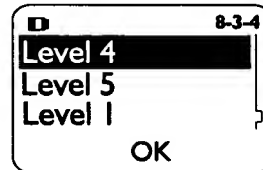
Ringtone

Your phone plays a ringing tone when someone calls you and the ringing option is set to **Ring**, **Ascending**, or **Ring once**. Use **Menu 8 2** to choose one of 30 ringing tones. Scroll to a tone to hear how it sounds.

*Note: If the ringing option is set to **Silent** or **Beep once**, the phone won't play sample tones.*

Ringtone volume

Use **Menu 8 3** to control the volume of your phone's ringing and of message alert tones.



Note: If your phone does not ring loudly enough at maximum volume, try a different ringing tone; some tones are louder than others.

Message alert tone

Use **Menu 8 4** to choose the tone played when you receive a text message. Scroll to a tone to hear how it sounds.

Keypad tones

Use **Menu 8 5** to adjust the volume of the tones your phone makes when you press its keys.

Warning and game tones


Use **Menu 8 6** to turn your phone's warning and game tones on or off. Warning tones are created by events such as confirmations, errors, power on, battery low, and recharge battery.

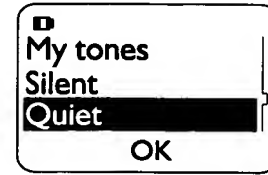
Vibrating alert




If your phone has a vibrating battery attached, use **Menu 8 7** to set your phone to vibrate when you receive a voice call. If you turn vibrating alert on, your phone will vibrate even if its ringing option is set to **Silent**.

Note: The vibrating battery does not vibrate when your phone is connected to or placed in any charging device.

Quick alert settings

You can quickly adjust your phone's sound settings when you go into a meeting, go outdoors, etc. To choose a quick alert setting, briefly press the  key, scroll to the setting you want, then press **OK**.



 **Tip:** Instead of using the scroll keys, you can press the  key repeatedly to scroll through this menu. After you reach the setting you want, press *and hold* the  key.

Note: If you choose **Silent** or **Quiet**, the alarm clock will only sound a quiet beep.

My tones Uses the settings you have made in Menu 8, My tones.

Silent All sound is turned off.

Quiet Your phone beeps once when you receive a call or text message. Other tones are turned off.



Loud Your phone rings loudly. Other tones are not affected.

Headset Automatically selected when your phone is connected to a headset. Remembers any changes you make to settings in Menu 8, My tones, and uses them the next time you connect the phone to a headset.

Car Automatically selected when your phone is connected to a car kit. Remembers any changes you make to settings in Menu 8, My tones, and uses them the next time you connect the phone to a car kit.

*Note: If the **Silent**, **Quiet**, or **Loud** quick alert setting is chosen and you change a setting in Menu 8, My tones, the phone switches the current quick alert setting to **My tones**.*

Voice mailbox number

If you have a voice mail subscription, use **Menu 2 2 2** to save the voice mailbox number given to you by your service provider. This number may be up to 32 digits long. Once you save your voice mailbox number, you can press and hold the  key to dial your voice mailbox. (You can also press  briefly and then press **Call**.)

For more information on voice mail, see 'Voice messages' on page 42.

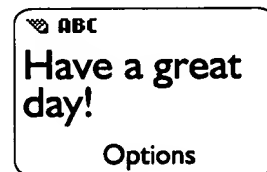
Voice privacy

Available only in digital networks, voice privacy encrypts the voice channel so it is more difficult for anyone to eavesdrop on your conversations. Use **Menu 4 4 1** to turn voice privacy on or off.


This feature may not be available in all areas; contact your service provider for details. If voice privacy becomes inactive, the phone beeps and displays **Voice privacy not active**.

Welcome note

Use **Menu 2 3** to create or change the welcome note for your phone. This note is displayed briefly each time you turn on your phone. It can be your name, a reminder, etc. To save the note, press **Options**, then **Save**. To erase the note, press **Options**, then **Erase**.



6. Emergency calls

- 1 If the phone is not on, switch it on.
- 2 Press and hold the  key for several seconds to ready the phone for calls.
- 3 Key in the emergency number for your present location (e.g. 911 or other official emergency number). Emergency numbers vary by location.
- 4 Press **Call**.

IMPORTANT!

This phone, like any wireless phone, operates using radio signals, wireless and landline networks as well as user-programmed functions which cannot guarantee connection in all conditions. Therefore you should never rely solely upon any wireless phone for essential communications (e.g. medical emergencies).

Remember, to make or receive any calls the phone must be switched on and in a service area with adequate signal strength. Emergency calls may not be possible on all wireless phone networks or when certain network services and/or phone features are in use. Check with local service providers.

If certain features are in use (Keyguard, call restrictions, etc.), you may first need to turn those features off before you can make an emergency call. Consult this document and your local cellular service provider.

When making an emergency call, remember to give all the necessary information as accurately as possible.

Remember that your wireless phone may be the only means of communication at the scene of an accident - do not cut off the call until given permission to do so.

Emergency key 9

Use **Menu** 4 1 1 to turn on this feature. When this feature is on, the phone attempts to make an emergency call when you:

- press and hold the 9 key, or
- press 9, then press **Call**.

*Note: When Keyguard is active, the only way to make an emergency call is to dial the emergency number, then press **Call**.*

IMPORTANT!

Official emergency numbers (for example, 911) vary by location. Only one number is dialed automatically by Emergency Key 9, and it might not be the proper number in all circumstances.

7. Advanced functions

Network feature setting

Call forwarding, call waiting, and send own number are network services available through your service provider. These features do not appear in your phone's **Network services** menu until you save the related feature code(s) given to you by your service provider. After you save the feature activation or cancellation code, the feature appears in the phone's menu and you can use the menu to turn the feature on or off.

Note: Feature codes can be saved only when your primary phone number (NAM 1) is selected. See page 31.

Adding feature activation codes to the menu

To save a feature activation code, press **Menu 4 4 2**. At the **Feature code:** prompt, enter the feature activation code, then press **OK**. Scroll to the feature that the code applies to, then press **Select**. (If the feature is call forwarding, choose one of the four types of call forwarding.) Finally, scroll to **Activate**, then press **OK**.




Activate will now appear in the menu for that feature.

Adding feature cancellation codes to the menu

To save a feature cancellation code, press **Menu 4 4 2**. At the **Feature code:** prompt, enter the feature cancellation code, then press **OK**. Scroll to the feature that the code applies to, then press **Select**. (If the feature is call forwarding, choose one of the four types of call forwarding.) Finally, scroll to **Cancel**, then press **OK**.

Cancel will now appear in the menu for that feature.

In-call menu

When you are in a call, the function of the Navi™ key is **End**. However, your phone has an in-call menu that allows you to perform several functions while in a call. To use the in-call menu, press  while you are in a call, then press **Options**. Press  to scroll to the first item in the menu, or  to scroll to the last item in the menu.

The in-call menu is:

Answer	answer a waiting call
Swap	switch between two calls
End	end all calls
New call	make a call when you have one in progress
Connect all	connect all active calls
Phone book	access the phone book
Menu	access your phone's menu
Touch tones	send touch tones
Mute/End mute	mute/unmute the phone's microphone

Making/receiving multiple calls

Making a new outgoing call

While you are in a call, select **New call** from the in-call menu. Enter the number (or press **Search** to locate the number in the phone book), then press **Call**. The first call is automatically put on hold while you are in your new call.

Note: This feature might not be supported in your network. Contact your service provider for details.

Three-way calling

Note: This feature might not be supported in your network or might work differently than described. For more information, contact your service provider.

To create a three-way call, call the first person. Then select **New call** from the in-call menu, enter or find the phone number of the second person, press **OK** and then press **Call**. The first person is put on hold. After the second person answers, choose **Connect all** from the in-call menu. Now all three of you can talk to each other at the same time.

Ending calls

Press **End** or select **End** from the in-call menu.

Note: The wireless network does not support ending individual calls when more than one call is in progress.

Call waiting

Call waiting is a network service that allows you to receive an incoming call when you're already in a call. Contact your service provider for details.

Answering a waiting call

Note: Call waiting is a network service that requires a subscription from your service provider.

If you are in a call with someone and another person calls you, the function of the Navi™ Key changes from **End** to **Options**. Press **Options**. The in-call menu appears with **Answer** selected. Press **OK**.

Swapping between calls

When you are in a call and you receive an indication of a waiting call, select **Answer** from the in-call menu. Your first call will be put on hold. To swap back to the first call, select **Swap** from the in-call menu.

Cancelling call waiting: standard method

To cancel call waiting before making a call, you must get the call waiting cancellation code from your service provider.

- 1 Dial the code for cancelling call waiting followed by the phone number you want to call.
- 2 Press **Call**.

Example: If the code for cancelling call waiting is *810 and the number you want to call is (214) 555-1234, dial ***8102145551234**, then press **Call**.

Cancelling call waiting: menu method

You can save the code for cancelling call waiting given by your service provider and then use **Menu 4 4 4 2** to cancel call waiting. See 'Adding feature cancellation codes to the menu' on page 27.

Call forwarding

Call forwarding is a network service that lets you forward your incoming calls to another phone number. Check with your service provider for details and feature codes.

Activating call forwarding

Standard method

To activate call forwarding, you must get the call forwarding activation code from your service provider.

- 1 Dial the code for activating call forwarding followed by the phone number to which you want to forward your calls.
- 2 Press **Call**.

Example: If the call forwarding activation code is *71 and the number you want to forward calls to is (214) 555-1234, dial ***712145551234**, then press **Call**.

Menu method

You can save the code for activating call forwarding and then use the menu to activate call forwarding. See 'Adding feature activation codes to the menu' on page 27.

Cancelling call forwarding

Standard method

To cancel call forwarding, you must get the call forwarding cancellation code from your service provider.

- 1 Dial the code for cancelling call forwarding (for example, *710).
- 2 Press **Call**.

Menu method

You can save the code for cancelling call forwarding and then use the menu to cancel call forwarding. See 'Adding feature cancellation codes to the menu' on page 27.



1-touch dialing

This feature allows you to make phone calls quickly and easily with the touch of a button. Once you have assigned a phone number to a number key (2 through 8), you can press and hold that key to dial the number. (You can also press the number key briefly and then press **Call**.)

Note: Keys 1 and 9 are used exclusively for dialing your voice mailbox and for attempting emergency calls, respectively (see 'Voice messages' on page 42 and 'Emergency calls' on page 25).

Assigning numbers to keys

Before you can assign a phone number to a key, the phone number must be saved in your phone book (see page 16). Then follow the steps below.

- 1 Press **Menu** 1 6.
- 2 Scroll to the desired key, then press **Assign**.
- 3 Press  or  to choose the name you want to assign to the selected key, then press **Select**.

If a key already has a number assigned to it, you can press **Options** and then view, change, or erase the number assignment.

Making calls using one-touch dialing

Press and hold a number key (2 through 8) for a few seconds to call the number assigned to it. Your phone finds the phone number, displays it briefly, then dials it.

You can also enter the number of the 1-touch dialing key (for example, 2) and press **Call**.

Choosing your phone number (NAM selection)

Your service provider can set up your phone to have two phone numbers that are activated in different service areas—for example, one number for the Dallas area and one number for the Chicago area.

A number assignment module, or NAM, consists of a phone number and network information that the service provider programs into your phone. When you select a NAM, you're not only selecting a phone number, you're also selecting a home system in which you will not be charged roaming fees.

The two NAMs are not equal. Some features, such as system selection (see page 33) and network feature setting (see page 27), are available only when the primary NAM is selected.

Use **Menu 4 5** to select a NAM.

Send own number

This network service allows you to hide your phone number from a person you are calling who has Caller ID. (If for some reason your network prevents phone numbers from being displayed, you may be able to use this feature to **show** your number to the person you are calling.) Contact your service provider for feature codes for showing/hiding your phone number.

Standard method

- 1 Dial the feature code followed by the number you want to call.
- 2 Press **Call**.

Example: If the feature code to hide your number is *67 and the number you want to dial is (214) 555-1234, dial ***672145551234**, then press **Call**.

Menu method

You can save the feature code given by your service provider so that **Send own number** appears in your phone's menu, and then use **Menu 4 4 5** to use this feature. See 'Network feature setting' on page 27.

This feature must be activated before each call.

Yes displays your number to the person you are calling.

No prevents your number from being shown to the person you are calling.

Calling card calls

Before you can make a call using a calling card, you have to enter your calling card information into the phone.

See 'Calling card set-up' on page 18.

To make a call using a calling card:

- 1 Enter the phone number, including any prefix (such as 0 or 1) that your calling card may require when you make a calling card call. See your calling card for instructions.
- 2 Press and hold **Call** for a few seconds until your phone displays **Card call**.
- 3 Your phone displays **Wait for tone, then press OK**. Wait for the tone, then press **OK**.
- 4 Your phone displays **Wait for tone, press OK again**. Wait for the tone again, then press **OK**.

System selection

Your phone is capable of working in residential, private, and public systems. You can choose how your phone selects a network to use.

This feature is **Menu 5** in your phone. The default is **Automatic**, which means your phone automatically searches for networks available to you and chooses the appropriate one. Every time you switch on your phone, **Automatic** is selected.

If you choose **Manual**, your phone displays a list of available and unavailable networks. (You can't use unavailable networks.) Scroll through the choices and press **OK** when you reach the one you want.

If you choose **New Search**, your phone begins a new search for new private and residential systems. When it finds the best new system, it displays it. You can then select it or start another search by pressing **Next**.

*Note: The **Manual** and **New search** features can be used only when your primary phone number (NAM1) is selected. See page 31.*

To switch from private to public

If you are in a private system and want access to a public system, press and hold **Menu** when you are not in a call. Your phone will display **Search public systems?** Press **OK** and your phone will use the public system for the next outgoing call. After the call it will revert to **Automatic** system selection.

Automatic answer

This feature is available only when your phone is connected to a headset or to an approved handsfree car kit equipped with the ignition sense option, with the ignition on.

When automatic answer is turned on, your phone answers incoming voice calls after one ring. Use **Menu 4 1 4** to turn this feature on or off.

Touch tones

Your phone can generate various sounds, called touch tones, when the keys are pressed.

Touch tones can be used for many automated services such as checking voice mail, movie times, and airline arrival/departure times.

Note: Sending confidential information over the air using touch tones is not recommended.

Setting manual touch tone length

Use **Menu 4 2 1 1** to set the length of touch tones created when you press a key:

Continuous means the tone sounds for as long as you press and hold the key.

Fixed sets the tone length to one tenth of a second, regardless of how long you press and hold the key.

Off turns off touch tones. No tones will be sent when you press the keys.

Setting automatic touch tone length


Use **Menu 4 2 1 2** to set the length of touch tones sent automatically by the phone to **Short** (one tenth of a second) or **Long** (half a second).

Saving touch tone strings

Touch tone strings can be used for sending and receiving information with your phone. Save touch tone strings the same way you save phone numbers (*see page 16*).

For example, you can save your office voice mailbox number along with your password for easy access to your messages. See 'Special characters in phone numbers' on page 12.

Sending touch tone strings

- 1 During a call, press  to clear any numbers from the display.
- 2 Press **Options**.
- 3 Scroll to **Touch tones**, then press **OK**.
- 4 Enter or find the touch tone string, then press **OK**.

Restore factory settings



You can use **Menu 4 2 3** to reset many of the settings in your phone to their factory defaults (as in a new phone). You will be required to enter the security code.

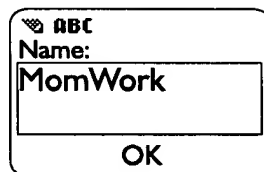
Note: The phone book, language setting, call timers, security code, and lock code are not affected.

8. Phone book

Your phone allows you to save 100 phone numbers and associated names so they are right at your fingertips for easy dialing.



Saving names and numbers

Saving a name and number is easy!
Just enter the phone number,
press  or , then press **Save**.
Enter a name if you wish, then press **OK**.




Each name may consist of up to 16 characters and each phone number may consist of up to 32 characters.


Saving a number quickly

To save a number quickly, enter the phone number,
press  or , then press *and hold* **Save**. The number is saved to your phone book and you can add a name to it later (see 'Editing names and numbers' on page 38).


Saving a name and number while in a call

To save a name and number while in a call:

- 1 Press .
- 2 Press **Options**.
- 3 Scroll to **Phone book**, then press **OK**.
- 4 Scroll to **Add new**, then press **Select**.
- 5 Enter a name if you like, then press **OK**.
- 6 Enter the phone number, then press **OK**.

The entry is displayed in your phone list. Press **Call** to call the number or  to clear the screen (the current call will not be affected).


Notes about saving names


- A name may appear only once in memory. If you try to save a name that already exists in memory, the phone asks if you want to replace the existing name.
- If you try to save a phone number and your phone book is full, you are given the option to replace an existing entry. Scroll to the entry you want to replace and press **OK**, or press  to cancel.

Finding names and numbers

There are several ways to find names and numbers in your phone book.

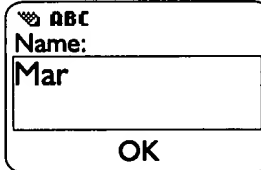
From the start screen

Press  to access your phone book, then scroll to the desired name/number.

 **Tip:** You can also press the number key that corresponds to the first letter of the name. The first matching entry is displayed at the top of the screen.

Using the Phone book menu

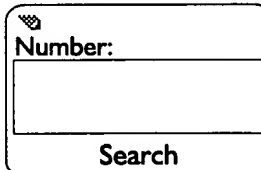
Press **Menu 1 1**, enter the first few letters of the name, then press **OK**. Your phone displays the first matching entry at the top of the screen.



A screenshot of a phone's search interface. At the top left is a small icon of a phone with a signal bar and the text 'ABC'. Below it is the label 'Name:'. A text input field contains the letters 'Mar'. At the bottom of the screen is a button labeled 'OK'.

While performing other functions

Say you want to forward your phone calls to a number that is saved in your phone book. When you are prompted to enter the phone number, you can find it instead—simply press **Search** to access your phone book.



A screenshot of a phone's search interface. At the top left is a small icon of a phone with a signal bar. Below it is the label 'Number:'. A text input field is empty. At the bottom of the screen is a button labeled 'Search'.

Editing names and numbers

To edit phone book entries, press **Menu 1 3**, scroll to the entry you want to edit, then press **Edit**. Edit the name and number as needed.

Erasing names and numbers

Use **Menu 1 4** to erase entries from your phone book. **One by one** lets you select one entry at a time to be erased. **Erase all** erases your entire phone book (you will be required to enter your security code first).

Scrolling view

Use **Menu 1 5 1** to choose a scrolling view for your phone book (**Name list**, **Name+number**, or **Name only**).



Tip: If your phone book's scrolling view is set to **Name list** or **Name only**, you can view the phone number associated with a name by pressing and holding the **(*)#** key.

Checking available memory

Use **Menu 1 5 2** to see how many memory locations are free and how many are being used. (Each memory location holds one phone number and associated name.)

9. Call log

For your convenience, the call log (Menu 3) saves a list of phone numbers you have dialed, and can show you how much time you have spent on the phone. If you subscribe to the caller ID network service, the call log also records the phone numbers of missed calls and received calls. Contact your service provider for details.

The Options key

When you access **Missed calls**, **Received calls**, or **Dialed calls** and press **Options**, a list of options appears on your phone's display.

Call dials the number.

Call time shows the time of the last call. (Your phone's clock must be set; see page 20.)

Edit number allows you to edit the number.

Save allows you to enter a name for the number, edit the number if needed, and save both to your phone book.

Erase erases the number from the call list.

View number displays the associated phone number if only the name is currently displayed.

Missed calls

If you subscribe to the caller ID network service, your phone automatically stores the last 10 numbers that have tried unsuccessfully to reach you (as long as the caller allowed his or her number to be shown to you).

When the display says Missed calls

Press **List**. If you have missed more than one call, you can scroll through the list of numbers. To dial the displayed number, press **Options**, then choose **Call**.


Viewing the missed calls list at any time

Use **Menu 3 1** to view the missed calls list at any time. To dial a number, press **Options**, then choose **Call**.

Received calls

If you subscribe to the caller ID network service, your phone automatically stores the phone numbers of the 10 most recent calls you've answered. Use **Menu 3 2** to view the received calls list. To dial a number, press **Options**, then choose **Call**.

Dialed calls

Your phone automatically stores the last 10 numbers you've dialed. From the start screen, press  to access the dialed calls list. Scroll to the desired number, then press **Call**.

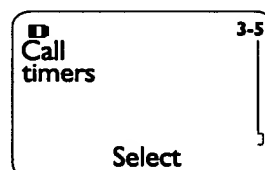
*Note: To perform any of the options listed on page 39, access the dialed calls list by pressing **Menu 3 3**.*

Clearing call lists

Use **Menu 3 4** to clear the missed, received, and/or dialed call lists.

Call timers

Use **Menu 3 5** to see the amount of time you've spent in calls. Times are for the currently selected phone number; your phone has a separate timer for each phone number, or NAM (see page 31).



Note: The actual time invoiced for calls by your service provider may vary, depending upon network features, rounding-off for billing, and so forth.

Viewing call timers

Use **Menu 3 5** to view the various call timers.

Last call is the duration of the last call, or current call if applicable.

All calls is the duration of all calls since the timers were last reset.

Life timer displays the duration of all calls for the life of your phone and cannot be reset.

Setting timers back to 0

Use **Menu 3 5 4** to clear call timers. You will be required to enter your security code.

Displaying the current call timer during calls


- 1 Press **Menu 3 5 1**.
- 2 Press **Details**.
- 3 Press **Select**.
- 4 Scroll to **On**, then press **OK**.

During a call, the amount of time spent in that call will be displayed.


10. Voice messages

Voice mail is a network service that allows callers to record a message when you cannot be reached. You can then call your voice mailbox and retrieve your messages.

Saving your voice mailbox number

When you subscribe to voice mail, your service provider will give you a voice mailbox number. You should save this number so you can call your voice mailbox by pressing and holding the  key. See 'Voice mailbox number' on page 24.


Listening to new voice messages

When you receive a voice message, your phone may notify you by beeping, displaying the voice message indicator , and displaying **New voice message**. The phone may display the number of messages if there is more than one.

Note: The method of notification depends on your service provider.

When your phone notifies you that you have a new voice message, press **Listen**. Your phone dials your voice mailbox number, if you have saved it.


Calling your voice mailbox at any time

Once you have saved your voice mailbox number, you can press and hold the  key to dial your voice mailbox.

11. Text messages

The text message network service allows you to receive text messages from a variety of sources, such as a Web page set up by your service provider. Contact your service provider for more information.

Reading messages

When you receive a text message, the phone displays the  indicator, either **Message received** or **New emergency message** (if an emergency message has been received), and makes a sound (depending on the message alert tone; see page 22).


To read the message, press **Read**. This takes you to the Inbox, with the new message selected. Press **Read** again. If necessary, use the scroll keys to read the entire message.

After reaching the end of the message, use the scroll keys to view the sender's name or phone number, and the date and time the message was received.

Options when reading messages


Several options are available while you're reading a message. Just press **Options**, scroll to the one you want, then press **OK**.

Read next allows you to read the next message.

Erase deletes the message. Press **OK** to confirm the deletion (or  to cancel).


Save saves the message in the **Saved** folder.


Call back calls any displayed phone number included in the message. If more than one number was included, a list of numbers is displayed. Choose one and press **Call**.

When you've seen the last new message, the  indicator disappears.

About the Inbox

The Inbox holds text messages that have not been deleted or saved. Use **Menu 2 1 1** to access the Inbox at any time.

You will see a list of message headers. The  icon in front of the header indicates that a message has been read.

The  icon indicates that a message has not been read.

Scroll to the desired message, then press **Read**.

About the Saved folder

The Saved folder holds up to 30 saved text messages.

Use **Menu 2 1 2** to access the Saved folder and read saved messages.

Storage of incoming messages

When you have an incoming text message and your phone's memory is full, one or more low-priority messages, which have been read, will automatically be deleted in order to receive the new text message. Messages are usually deleted from your Inbox, but an emergency message may cause messages to be deleted from the Saved folder.

If the message memory is still full, your phone will display **No space: message waiting**. You can clear this notification by pressing **OK**. You should delete one or more old messages to make room for the new message. The network will re-send the message at a later time.

Erasing all text messages

Use **Menu 2 1 5** to access the **Erase all** option for **Text messages**. **Erase all** allows you to permanently erase all messages from one of the following categories:

All read Erases all read messages in the inbox

All in inbox Erases all messages in the inbox

All saved Erases all messages stored in the Saved folder

All in outbox Erases all messages in the outbox (5160i only)

Text message features for the 5160i

If you have the Nokia 5160i, you have the capability to write, send, forward and reply to text messages. Your phone must be a 5160i to perform these functions, and you must subscribe to the text messaging network service.

Note: The availability of writing and sending text messages may vary according to your wireless service provider. Please contact your service provider for details.

Writing and sending text messages

The 5160i allows you to write a text message using your keypad. Once you have written a message on your screen, you will have options for sending your message.

Writing a text message

- 1 Press **Menu** 2 1 3 and select **Write new**
- 2 Write your text message by entering letters and numbers from your keypad
- 3 The function of the Navi™ key will change to **Options**

Your **Options** menu is:

Send	send the message
Back	return to the Text messages menu
Clear screen	clear all entered text from the screen
Settings	choose a setting for your message
Save	store the text message to Saved

Sending a text messages

- 1 Write a text message and press **Options**
- 2 To send the message, highlight **Send** and press **OK**
- 3 Enter the phone number (or press **Search** to locate the number in the phone book), then press **Send**

Message settings

This network feature allows you to mark your text message as urgent, place your number within the text message, or request a read receipt. This is a network feature. Contact your service provider for more information.



Message settings are located in the **Write new** options menu as **Settings**. You may select or deselect the following settings by pressing **Mark** or **Unmark**.

- Urgent** notify recipient that your message is important
- Read receipt** notify you that the recipient has opened your message
- Callback no.** place your phone number within the message

Received **Urgent** messages are indicated with an exclamation mark (!) in front of the message.

*Note: **Callback no.** is the default setting for your phone.*

About the Outbox

Use Menu 2 1 4 to access the Outbox. The Outbox stores messages that were sent successfully as well as messages that were sent unsuccessfully. The  icon in front of a message heading shows that you have sent the message to the text message center. The  icon shows that you attempted to send the message, but your attempt was unsuccessful.

Press **Read** to read the selected message.

Forwarding and replying to a message

You can forward or reply to messages which are located in the **Inbox**, **Saved** folder or **Outbox** of your 5160i. Highlight the message and press **Read**. The **Options** menu appears.

Forwarding a text message

- 1 Highlight the message that you want to forward
- 2 Press **Read**, then press **Options**
- 3 Scroll to **Forward**, press **OK**
- 4 Send the message as you normally would

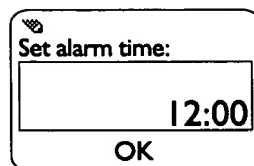
Replying to a text message

- 1 Highlight the message that you want to reply to
- 2 Press **Read**, then press **Options**
- 3 Scroll to **Reply**, press **OK**
- 4 Send the message as you normally would

12. Extra features

Alarm clock


The alarm clock feature is based on your phone's internal clock and sounds an alert at a time you specify.



Setting the alarm clock

Use **Menu 7 1** to turn the alarm clock on or off.

Note that when you're entering the alarm time, use two digits for both hours and minutes (for example, enter 1:30 as **0130**). If the clock's time format (see page 20) is set to **am/pm**, you will be asked to choose **am** or **pm**.

Note: The  key does not work on this screen. If you make a mistake, re-enter all four digits.

Alarm volume


The alarm volume is determined by the current ringing volume. However, if you have manually set the ringing option (see page 21) to **Silent** or **Beep once** or have selected the **Silent** or **Quiet** quick alert setting (see page 23), the phone only sounds a quiet beep.

When the alarm sounds

- To shut off the alarm, press any key except **Snooze**.
- If you press **Snooze**, the alarm sounds again in 10 minutes. To turn off the alarm before then, press **Stop**.
- If you let the alarm sound for one minute without pressing a key, it stops for 10 minutes, then starts again.


If you turn off the phone

If you turn off the phone and the alarm is set, the phone switches itself on at alarm time, then the alarm sounds.

- To shut off the alarm, press any key except **Snooze**. The phone displays **Keep the phone on?** Press **Yes** to keep it on or  to switch it off.
- If you press **Snooze**, the phone turns itself off for 10 minutes, then the alarm sounds again.



REMEMBER! Do not switch on the phone when wireless phone use is prohibited or when it may cause interference or danger.

Games

Use **Menu 6** to challenge yourself or a friend to the three fun games in your phone. To pause a game, press . To resume, choose **Continue**.

REMEMBER! Your phone must be switched on to use this function. Do not switch on the phone when wireless phone use is prohibited or when it may cause interference or danger.


Memory

Reveal pictures to find pairs in as few tries as possible. Move the cursor with the 2 (up), 4 (left), 6 (right), and 8 (down) keys. Press the 5 key to reveal pictures. Once found, pairs stay visible. Press the  key to jump to the right over revealed pictures or to move from the bottom right of the screen to the top left. Press the  key to jump to the left over revealed pictures or to move from the top left of the screen to the bottom right.

Snake

Feed the snake with as many goodies as possible and watch it grow. Use keys 2, 4, 6, and 8 to turn the snake toward food. The longer the snake's tail grows, the higher your score. If the snake hits its own tail or the surrounding wall, the game is over.

Logic

Find the secret combination of figures in a column. Possible figures are shown at the top of the display. Press the 5 key repeatedly to select a figure and the 2, 4, and 8 keys to move the cursor. Once you think you have the right combination, press the  key. The result appears as a set of marks above the column. A correct figure in the right place gets a full mark; a correct figure in the wrong place gets a half mark. The game ends when the correct figures are in the right place.



Tip: To copy a figure from the previous column, move the cursor over it using the 2, 4, or 8 key, then press the 5 key.

13. Security features

Access codes overview

Access codes consist of the lock code and security code. When you get your phone, you should change these codes from their defaults, write down the new codes, and keep them in a safe place away from the phone. Avoid using access codes that are similar to emergency numbers, such as 911, to prevent accidental dialing of the emergency number.

Lock code

Your phone's lock code is used to lock and unlock your phone. The default lock code is 1234. Use **Menu 4 3 2 3** to change the lock code.

When the phone requires the lock code, it displays **Enter lock code:** Enter the code, then press **OK**.

If you enter a wrong lock code five times in succession, your phone prompts you for the security code.

Security code

The security code is required to restrict calls and to restore factory settings. The default security code is 12345. Use **Menu 4 3 2 4** to change the security code.



When the phone requires the security code, it displays **Security code:** Enter the code, then press **OK**.

If you enter an incorrect security code five times in succession, the phone will not accept any input for the next five minutes.

Restricting calls



Use **Menu 4 3 1** to restrict outgoing or incoming calls. This is handy if you want to lend your phone to someone but don't want them to make long-distance or other expensive calls.

Restricting incoming calls

Choose **Restrict incoming calls** to prevent your phone from receiving incoming calls. Enter your security code, then press **OK**. Press **Mark**, then press . Press **Yes** to save this change (or  to cancel).

Note: This feature requires the caller ID network service, and the caller's ID must be available to the phone in order for the restriction to work.

Allowing incoming calls

To allow incoming calls once again, choose **Restrict incoming calls** and enter your security code. Press **Unmark**, then press . Press **Yes** to save this change (or  to cancel).

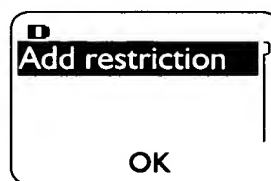
Restricting outgoing calls

You can create a list of numbers to which outgoing calls cannot be made. A call restriction can consist of an entire phone number, an area code, etc. When the restriction is selected, calls cannot be made to any number beginning with those digits. For example, entering **2145551234** will block calls to (214) 555-1234 only. **1** will block all calls starting with 1, including long distance calls and 1-800 calls. **1800** will block 1-800 calls only.

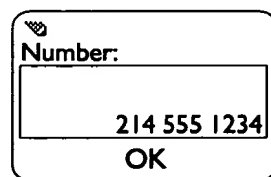
Adding numbers to the restricted outgoing calls list

To prevent your phone from making outgoing calls, choose **Restrict outgoing calls**. Enter your security code, then press **OK**. Continue with the steps illustrated below.

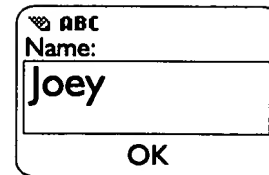
- 1 **Add restriction** is selected.
Press **OK**.



- 2 Enter the phone number, area code, etc. to which you want to restrict calls, then press **OK**.



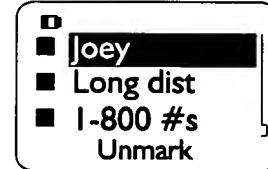
- 3 If you want, give a name of up to 10 characters to the restriction (such as **Joey**, **Long dist**, or **1-800 #s**), then press **OK**.

A screenshot of a phone screen showing a restriction name entry. At the top, there is a small icon of a phone with the letters 'ABC' next to it. Below this, the text 'Name:' is displayed. A text input field contains the name 'Joey'. At the bottom of the screen, there is an 'OK' button.

The entry is added to your list of restricted numbers.

Allowing calls to a number on the list

If you later decide to allow calls to a restricted number, press **Select** to see your list of numbers. Press **Unmark** to remove the restriction. (The number remains in the list so that you can restrict it again later by pressing **Mark**.) When you're done, press **⌂**. Press **Yes** to save your changes (or **⌂** to cancel).

A screenshot of a phone screen showing a list of restricted numbers. At the top, there is a small icon of a phone with the letters 'ABC' next to it. Below this, the text 'Name:' is displayed. A list of numbers is shown: 'Joey', 'Long dist', and '1-800 #s'. At the bottom of the screen, there is an 'Unmark' button.

Making changes to the restricted outgoing calls list

To edit or completely erase an entry in the list, choose **Edit** or **Erase**, select the entry you want to edit or erase, and follow the instructions on the screen.

Phone lock

You can prevent unauthorized use of your phone by locking it. When your phone is locked, only incoming calls and calls to the unlocked phone number (see below) are allowed. The memory and menu are unavailable.

Note: Calls may still be possible to emergency numbers.

How to lock your phone

Press **Menu** 4 3 2 1. Enter the lock code (see page 51), then press **OK**. Scroll to **On**, then press **OK**.

How to unlock your phone

Press **Menu**, enter the lock code, then press **OK**.



Answering a call when the phone is locked

Press **Answer**.

Saving the unlocked phone number

Use **Menu 4 3 2 2** to save a number that may be called even when your phone is locked. You will be required to enter the lock code.

Calling the unlocked phone number

Press  or , or manually enter the number exactly as it is saved, then press **Call**.

14. Accessories

An extensive range of accessories is available for your phone. You can select the accessories that best suit your specific communication needs. For availability, see your local authorized Nokia dealer.



A few practical rules for accessory operation:

- Keep accessories out of small children's reach.
- When you disconnect the power cord of any accessory, grasp and pull the plug, not the cord.
- Check regularly that all wireless phone equipment in your vehicle is mounted and operating properly.
- Installation of complex car equipment must be completed by qualified personnel only.

WARNING!

Use only batteries, chargers and accessories approved by the phone manufacturer for use with this particular phone model. The use of any other types may invalidate any approval or warranty applying to the phone, and may be dangerous.

Nokia Xpress-on™ color covers

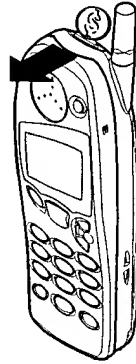
Your phone's Xpress-on™ cover is available in several fashion colors. Extra covers may be purchased from your authorized Nokia dealer.

Note: Always store the phone with cover attached.

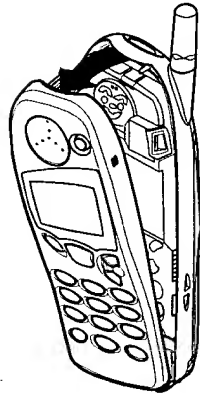
Changing covers

When changing covers, don't use the phone's antenna as leverage!

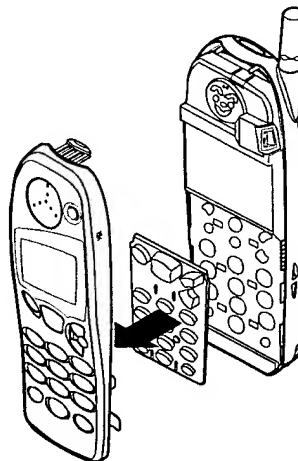
- 1 Switch off the power and disconnect the phone from the charger or any other device.
- 2 Using a coin, depress the colored tab on the top of the phone and slide the color cover forward.

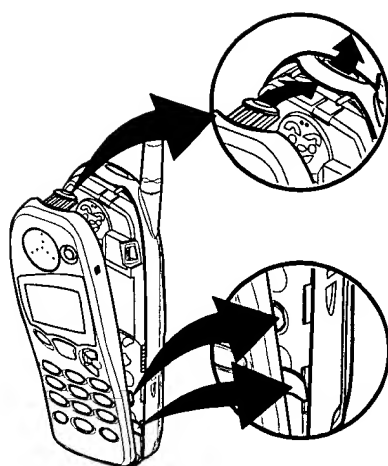


- 3 Remove the cover.



- 4 Remove the rubber keypad from the back of the cover. Place it into the back of the new cover.





- 5 Place the bottom of the cover against the bottom of the phone. Make sure all three sets of plastic tabs line up with their respective slots, as shown at left. Close the cover and snap it shut all the way around the edge of the phone.

Batteries

Several batteries are available for your phone:

- BPS-1 Ultra Slim Li-Polymer 600 mAh
- BLS-2N Extended Li-Ion 900 mAh
- BMS-2S Extended NiMH 900 mAh
- BMS-2V Vibrating NiMH 900 mAh
- BLS-4 Ultra Extended Li-Ion 1500 mAh

Charging times

The table below displays approximate battery charging times. These charging times will charge your phone to about 80% of its capacity, and the battery strength indicator will stop scrolling. If you wish to obtain 100% battery capacity, please allow another two hours for "maintenance" charge.

Battery	Standard Travel Charger ACP-7U	Rapid Travel Charger ACP-9U	Rapid Mobile Charger LCH-8
BPS-1 Ultra Slim Li-Polymer 600 mAh	2 hours, 30 minutes	1 hour, 20 minutes	
BLS-2N Extended Li-Ion 900 mAh	4 hours	2 hours	
BMS-2S Extended NiMH 900 mAh		1 hour, 30 minutes	
BMS-2V Vibrating NiMH 900 mAh			
BLS-4 Ultra Extended Li-Ion 1500 mAh	5 hours	3 hours, 30 minutes	

Talk and standby times

The table below displays approximate talk and standby times. Variations will occur depending on network settings and usage.

Battery	Talk Time		Standby Time	
	Digital	Analog	Digital	Analog
BPS-1 Ultra Slim Li-Polymer 600 mAh	1 hr, 20 min - 2 hrs, 10 min	40 min - 1 hr, 15 min	66 - 133 hrs	20 - 33 hrs
BLS-2N Extended Li-Ion 900 mAh	2 hrs - 3 hrs, 15 min	1 hr - 1 hr, 45 min	100 - 200 hrs	30 - 50 hrs
BMS-2S Extended NiMH 900 mAh				
BMS-2V Vibrating NiMH 900 mAh				
BLS-4 Ultra Extended Li-Ion 1500 mAh	3 - 5 hrs	1 hr, 30 min - 2 hrs, 45 min	170 - 335 hrs	50 - 83 hrs

Chargers and other accessories

WARNING!

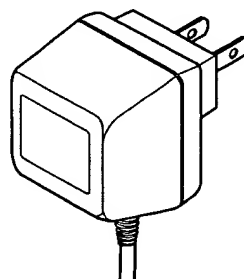
This apparatus is intended for use when supplied with power from the Standard Travel Charger (ACP-7U), Rapid Travel Charger (ACP-9U), or Rapid Mobile Charger (LCH-8). Other usage will invalidate any approval given to this apparatus and may be dangerous.

The following chargers and other accessories are available for your phone; please see your dealer for details. Also, refer to any accessory options manual that may have been included in your sales package for the entire line of Nokia Original Accessories.

Note: When a charger is not in use, disconnect it from the power source. Do not leave the battery connected to a charger for longer than a week, since overcharging may shorten its life. If left unused, a fully charged battery will discharge itself over time.

ACP-7U Standard Travel Charger

Use this durable and economical charger to charge all battery options. Plug the charger into a wall outlet and connect the connector to the bottom of your phone.



Check the charging status on the phone display.

Calls can be made during charging, but charging will stop for the duration of the call.

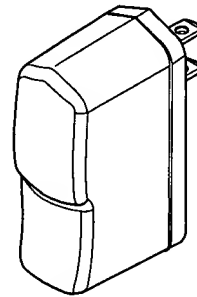
Note: If the battery is completely empty, you cannot use the phone until it has enough charge to operate.

The Standard Travel Charger is available for different voltage levels and can also be used with the DCH-9 Compact Desktop Charging Stand.

ACP-9U Rapid Travel Charger

The extremely light, functionally designed Rapid Travel Charger charges your phone battery quickly.

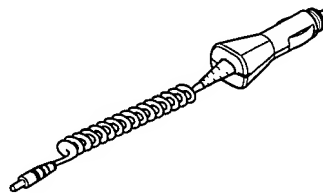
Plug the charger into a wall outlet and connect the connector to the bottom of your phone. Check the charging status on the phone display. You can use your phone while charging.



Operating within a voltage range of 100V-240V AC (50Hz-60Hz), the Rapid Travel Charger is practically voltage-independent in normal office and household use. Like the Standard Travel Charger, the Rapid Travel Charger is compatible with all battery options. The Rapid Travel Charger can also be used with the DCH-9 Compact Desktop Charging Stand.

LCH-8 Rapid Mobile Charger

The multivoltage Rapid Mobile Charger allows you to charge your phone when you travel. The small charger's functional design fits well with most car lighters and interiors.



Charging times are the same as for the Rapid Travel Charger ACP-9U. Calls can be made during charging.

A green light indicates that the Rapid Mobile Charger is ready to charge. Check the charging status on the phone

display. The input voltage is 12 or 24 V DC, negative grounding.

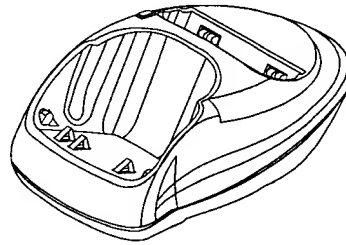
The Rapid Mobile Charger can be used with all accessories available for your phone.

Avoid prolonged charging with the Rapid Mobile Charger when the car engine is not running. This may cause the battery of your car to drain.

Note: In some cars the cigarette lighter plug is not provided with power when the ignition is switched off. Verify that the green LED light is lit.

DCH-9 Compact Desktop Charging Stand

Compatible with all battery options, the Compact Desktop Charging Stand can be used with the Standard Travel Charger ACP-7U or the Rapid Travel Charger ACP-9U. The Compact Desktop Charging Stand



provides mounting for both the phone and a spare battery. Plug the charger into a wall outlet and connect the connector to the back of the Compact Desktop Charging Stand. Place your phone and/or a spare battery in the stand to begin battery charging.

When the phone is charging, no lights are displayed on the stand; check the charging status of the phone battery on the phone display.

Charging moves to the rear slot once the front battery is 100% charged.

When the spare battery is charging, check the status indicator on the left side of the charging stand. A red light indicates that the battery is charging; a green light indicates that the battery is charged to at least 80% of its capacity.

DCH-9 Rear Slot Charging Times				
Battery	Using ACP-7U		Using ACP-9U	
	Front slot empty	Front slot occupied	Front slot empty	Front slot occupied
BPS-1 Ultra Slim Li-Polymer 600 mAh	4 hours, 30 minutes	6 hours, 30 minutes	3 hours	4 hours, 30 minutes
BLS-2N Extended Li-Ion 900 mAh	6 hours, 30 minutes	8 hours, 30 minutes	4 hours, 30 minutes	5 hours, 30 minutes
BMS-2S Extended NiMH 900 mAh				
BMS-2V Vibrating NiMH 900 mAh				
BLS-4 Ultra Extended Li-Ion 1500 mAh	12 hours	15 hours, 45 minutes	8 hours	10 hours, 30 minutes

The phone has the built-in intelligence to maintain the battery, so there is no need for a discharge feature on the stand.

15. Reference information

Important safety information

Traffic safety

Do not use a hand-held telephone while driving a vehicle. If using a hand-held phone park the vehicle before conversing.

Always secure the phone in its holder; do not place the phone on the passenger seat or where it can break loose in a collision or sudden stop.

The use of an alert device to operate a vehicle's lights or horn on public roads is not permitted.

Remember, road safety always comes first!

Operating environment

Remember to follow any special regulations in force in any area and always switch off your phone whenever it is forbidden to use it, or when it may cause interference or danger.

When connecting the phone or any accessory to another device, read its user's guide for detailed safety instructions. Do not connect incompatible products.

As with other mobile radio transmitting equipment, users are advised that for the satisfactory operation of the equipment and for the safety of personnel, it is recommended that the equipment should only be used in the normal operating position (held to your ear with the antenna pointing over your shoulder).

Electronic devices

Most modern electronic equipment is shielded from radio frequency (RF) signals. However, certain electronic equipment may not be shielded against the RF signals from your wireless phone.

Pacemakers

Pacemaker manufacturers recommend that a minimum separation of 6 inches (20 cm.) be maintained between a handheld wireless phone and a pacemaker to avoid potential interference with the pacemaker. These recommendations are consistent with the independent research by and recommendations of Wireless Technology Research.

Persons with pacemakers:

- Should always keep the phone more than 6 inches (20 cm) from their pacemaker when the phone is switched on;
- Should not carry the phone in a breast pocket;
- Should use the ear opposite the pacemaker to minimize the potential for interference.
- If you have any reason to suspect that interference is taking place, switch off your phone immediately.

Hearing aids

Some digital wireless phones may interfere with some hearing aids. In the event of such interference, you may want to consult your service provider.

Other medical devices

Operation of any radio transmitting equipment, including cellular phones, may interfere with the functionality of inadequately protected medical devices. Consult a physician or the manufacturer of the medical device to determine if they are adequately shielded from external RF energy or if you have any questions. Switch off your phone in health care facilities when any regulations posted in these areas instruct you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.

Vehicles

RF signals may affect improperly installed or inadequately shielded electronic systems in motor vehicles (e.g. electronic fuel injection systems, electronic anti-skid (anti-lock) braking systems, electronic speed control systems, air bag systems). Check with the manufacturer or its representative regarding your vehicle. You should also consult the manufacturer of any equipment that has been added to your vehicle.

Posted facilities

Switch your phone off in any facility where posted notices so require.

Potentially explosive atmospheres

Switch off your phone when in any area with a potentially explosive atmosphere and obey all signs and instructions. Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

Users are advised to switch off the phone while at a refueling point (service station). Users are reminded of the need to observe restrictions on the use of radio equipment in fuel depots (fuel storage and distribution areas), chemical plants or where blasting operations are in progress.

Areas with a potentially explosive atmosphere are often but not always clearly marked. They include below deck on boats; chemical transfer or storage facilities; vehicles using liquefied petroleum gas (such as propane or butane); areas where the air contains chemicals or particles, such as grain, dust or metal powders; and any other area where you would normally be advised to turn off your vehicle engine.

Vehicles

Only qualified personnel should service the phone, or install the phone in a vehicle. Faulty installation or service may be dangerous and may invalidate any warranty which may apply to the unit.

Check regularly that all wireless phone equipment in your vehicle is mounted and operating properly.

Do not store or carry flammable liquids, gases or explosive materials in the same compartment as the phone, its parts or accessories.

For vehicles equipped with an air bag, remember that an air bag inflates with great force. Do not place objects, including both installed or portable wireless equipment, in the area over the air bag or in the air bag deployment area. If in-vehicle wireless equipment is improperly installed and the air bag inflates, serious injury could result.

Switch off your phone before boarding an aircraft. The use of wireless telephones in an aircraft may be dangerous to the operation of the aircraft, disrupt the wireless telephone network and may be illegal.

Failure to observe these instructions may lead to the suspension or denial of telephone services to the offender, or legal action, or both.


Emergency calls

IMPORTANT!

This phone, like any wireless phone, operates using radio signals, wireless and landline networks as well as user-programmed functions which cannot guarantee connection in all conditions. Therefore, you should never rely solely upon any wireless phone for essential communications (e.g. medical emergencies).

Remember, to make or receive any calls the phone must be switched on and in a service area with adequate signal strength. Emergency calls may not be possible on all wireless phone networks or when certain network services and/or phone features are in use. Check with local service providers.

Making an emergency call

- 1 If the phone is not on, switch it on.
- 2 Press and hold the  key for several seconds to ready the phone for calls.
- 3 Key in the emergency number for your present location (e.g. 911 or other official emergency number). Emergency numbers vary by location.
- 4 Press **Call**

If certain features are in use (Keyguard, call restrictions, etc.), you may first need to turn those features off before you can make an emergency call. Consult this document and your local cellular service provider.

When making an emergency call, remember to give all the necessary information as accurately as possible. Remember that your wireless phone may be the only means of communication at the scene of an accident - do not cut off the call until given permission to do so.

Radio frequency (RF) signals

THIS MODEL PHONE MEETS THE GOVERNMENT'S REQUIREMENTS FOR EXPOSURE TO RADIO WAVES.

Your wireless phone is a radio transmitter and receiver. It is designed and manufactured not to exceed the emission limits for exposure to radiofrequency (RF) energy set by the Federal Communications Commission of the U.S. Government. These limits are part of comprehensive guidelines and establish permitted levels of RF energy for the general population. The guidelines are based on standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies. The standards include a substantial safety margin designed to assure the safety of all persons, regardless of age and health.

The exposure standard for wireless mobile phones employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg.* Tests for SAR are conducted using standard operating positions accepted by the FCC with the phone transmitting at its highest certified power level in all tested frequency bands. Although the SAR is determined at the highest certified power level, the actual SAR level of the phone while operating can be well below the maximum value. This is because the phone is designed to operate at multiple power levels so as to use only the power required to reach the network. In general, the closer you are to a wireless base station antenna, the lower the power output.

Before a phone model is available for sale to the public, it must be tested and certified to the FCC that it does not exceed the limit established by the government-adopted requirement for safe exposure. The tests are performed in positions and locations (e.g., at the ear) as required by the FCC for each model. The highest SAR value for this model phone when tested for use at the ear is 1.46 W/kg. While there may be differences between the SAR levels of various phones and at various positions, they all meet the government requirement.

The FCC has granted an Equipment Authorization for this model phone with all reported SAR levels evaluated as in compliance with the FCC RF exposure guidelines. SAR information on this model phone is on file with the FCC and can be found under the Display Grant section of <http://www.fcc.gov/oet/fccid> after searching on FCC ID LIPNSW-1NX.

*In the United States and Canada, the SAR limit for mobile phones used by the public is 1.6 watts/kg (W/kg) averaged over one gram of tissue. The standard incorporates a substantial margin of safety to give additional protection for the public and to account for any variations in measurements.

Care and maintenance

Your phone is a product of superior design and craftsmanship and should be treated with care. The suggestions below will help you to fulfill any warranty obligations and allow you to enjoy this product for many years. When using your phone, battery, charger, OR any accessory:

- Keep it and all its parts and accessories out of small children's reach.
- Keep it dry. Precipitation, humidity and liquids contain minerals that will corrode electronic circuits.
- Do not use or store it in dusty, dirty areas as its moving parts can be damaged.
- Do not store it in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store it in cold areas. When the phone warms up (to its normal operating temperature), moisture can form inside the phone, which may damage the phone's electronic circuit boards.
- Do not attempt to open it. Non-expert handling of the device may damage it.
- Do not drop, knock or shake it. Rough handling can break internal circuit boards.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean it. Wipe it with a soft cloth slightly dampened in a mild soap-and-water solution.
- Do not paint it. Paint can clog the device's moving parts and prevent proper operation.
- Use only the supplied or an approved replacement antenna. Unauthorized antennas, modifications or attachments could damage the phone and may violate regulations governing radio devices.
- If the phone, battery, charger, or any accessory is not working properly, take it to your nearest qualified service facility. The personnel there will assist you, and if necessary, arrange for service.

16. Technical information

Transmitting power:	Up to 600 mW nominal
Operating voltage:	3.6 V nominal
Frequency band:	lowband 824.04 - 848.97 MHz (TX) 869.04 - 893.97 MHz (RX) highband 1850.04 - 1909.92 MHz (TX) 1930.08 - 1989.96 MHz (RX)
Number of channels:	832 lowband 1997 highband
Number of NAMs	2
Memory locations:	100
Memory capacity:	16 characters per name 32 characters per number

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Para obtener un manual del usuario en español favor de llamar o enviar un fax al teléfono 1-888-NOKIA2U (1-888-665-4228), fax 813-249-9619.

For alternate formats of this owner's manual, call our Customer Care center at 1-888-665-4228 (NOKIA2U).

17. NOKIA One-Year Limited Warranty

Nokia Inc. ("Nokia") warrants that this cellular phone ("Product") is free from defects in material and workmanship that result in Product failure during normal usage, according to the following terms and conditions:

1. The limited warranty for the Product extends for ONE (1) year beginning on the date of the purchase of the Product.
2. The limited warranty extends to the original purchaser of the Product ("Consumer") and is not assignable or transferable to any subsequent purchaser/end-user.
3. The limited warranty extends only to Consumers who purchase the Product in the United States.
4. During the limited warranty period, Nokia will repair, or replace, at Nokia's option, any defective parts, or any parts that will not properly operate for their intended use with new or factory rebuilt replacement items if such repair or replacement is needed because of product malfunction or failure during normal usage. No charge will be made to the Consumer for any such parts. Nokia will also pay for the labor charges incurred by Nokia in repairing or replacing the defective parts. The limited warranty does not cover defects in appearance, cosmetic, decorative or structural items, including framing, and any non-operative parts. Nokia's limit of liability under the limited warranty shall be the actual cash value of the Product at the time the Consumer returns the Product for repair, determined by the price paid by the Consumer for the Product less a reasonable amount for usage. Nokia shall not be liable for any other losses or damages. These remedies are the Consumer's exclusive remedies for breach of warranty.
5. Upon request from Nokia, the Consumer must prove the date of the original purchase of the Product by a dated bill of sale or dated itemized receipt.
6. The Consumer shall bear the cost of shipping the Product to Nokia in Melbourne, Florida. Nokia shall bear the cost of shipping the Product back to the Consumer after the completion of service under this limited warranty.
7. The Consumer shall have no coverage or benefits under this limited warranty if any of the following conditions are applicable:
 - a) The Product has been subject to abnormal use, abnormal conditions, improper storage, exposure to moisture or dampness, unauthorized modifications, unauthorized connections, unauthorized repair, misuse, neglect, abuse, accident, alteration, improper installation, or other acts which are not the fault of Nokia, including damage caused by shipping.

b) The Product has been damaged from external causes such as collision with an object, or from fire, flooding, sand, dirt, windstorm, lightning, earthquake or damage from exposure to weather conditions, an Act of God, or battery leakage, theft, blown fuse, or improper use of any electrical source, or damage caused by the connection to other products not recommended for interconnection by Nokia.

c) Nokia was not advised by the Consumer in writing of the alleged defect or malfunction of the Product within fourteen (14) days after the expiration of the applicable limited warranty period.

d) The Product serial number plate or the accessory data code has been removed, defaced or altered.

e) The defect or damage was caused by the defective function of the cellular system or by inadequate signal reception by the external antenna.

8. If a problem develops during the limited warranty period, the Consumer shall take the following step-by-step procedure:

a) The Consumer shall return the Product to the place of purchase for repair or replacement processing.

b) If "a" is not convenient because of distance (more than 50 miles) or for other good cause, the Consumer shall ship the Product prepaid and insured to:

Nokia Inc.
Attn: Repair Department
795 West Nasa Blvd.
Melbourne, FL. 32901

c) The Consumer shall include a return address, daytime phone number and/or fax number, complete description of the problem, proof of purchase and service agreement (if applicable). Expenses related to removing the Product from an installation are not covered under this limited warranty.

d) The Consumer will be billed for any parts or labor charges not covered by this limited warranty. The Consumer will be responsible for any expenses related to reinstallation of the Product.

e) Nokia will repair or authorize the repair of the Product under the limited warranty within 30 days after receipt of the Product by Nokia or an Nokia authorized service center. If Nokia cannot perform repair covered under this limited warranty within 30 days, or after a reasonable number of attempts to repair the same defect, Nokia at its option, will provide a replacement Product or refund the purchase price of the Product less a reasonable amount for usage.

f) If the Product is returned to Nokia during the limited warranty period, but the problem with the Product is not covered under the terms and conditions of this limited warranty, the Consumer will be notified and given an estimate of the charges the Consumer must pay to have the Product repaired, with all shipping charges billed to the Consumer. If the estimate is refused, the Product will be returned freight collect. If the Product is returned to Nokia after the expiration of the limited warranty period, Nokia's normal service policies shall apply and the Consumer will be responsible for all shipping charges.

9. The Product consists of newly assembled equipment that may contain used components that have been reprocessed to allow machine compliance with Product performance and reliability specifications.

10. ANY IMPLIED WARRANTY OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE OR USE, SHALL BE LIMITED TO THE DURATION OF THE FOREGOING LIMITED WRITTEN WARRANTY. OTHERWISE, THE FOREGOING LIMITED WARRANTY IS THE CONSUMER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. NOKIA SHALL NOT BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO, LOSS OF ANTICIPATED BENEFITS OR PROFITS, LOSS OF SAVINGS OR REVENUE, PUNITIVE DAMAGES, LOSS OF USE OF THE PRODUCT OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF ANY SUBSTITUTE EQUIPMENT OR FACILITIES, DOWNTIME, THE CLAIMS OF ANY THIRD PARTIES, INCLUDING CUSTOMERS, AND INJURY TO PROPERTY, RESULTING FROM THE PURCHASE OR USE OF THE PRODUCT OR ARISING FROM BREACH OF THE WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT, OR ANY OTHER LEGAL OR EQUITABLE THEORY, EVEN IF NOKIA KNEW OF THE LIKELIHOOD OF SUCH DAMAGES. NOKIA SHALL NOT BE LIABLE FOR DELAY IN RENDERING SERVICE UNDER THE LIMITED WARRANTY, OR LOSS OF USE DURING THE PERIOD THAT THE PRODUCT IS BEING REPAIRED.

11. Some states do not allow limitation of how long an implied warranty lasts, so the above one-year warranty limitation may not apply to you (the Consumer). Some states do not allow the exclusion or limitation of incidental and consequential damages, so certain of the above limitations or exclusions may not apply to you (the Consumer). This limited warranty gives the Consumer specific legal rights and the Consumer may also have other rights which vary from state to state.

12. Nokia neither assumes nor authorizes any authorized service center or any other person or entity to assume for it any other obligation or liability beyond that which is expressly provided for in this limited warranty including the provider or seller of any extended warranty or service agreement.

13. This is the entire warranty between Nokia and the Consumer, and supersedes all prior and contemporaneous agreements or understandings, oral or written, and all communications relating to the Product, and no representation, promise or condition not contained herein shall modify these terms.

14. This limited warranty allocates the risk of failure of the Product between the Consumer and Nokia. The allocation is recognized by the Consumer and is reflected in the purchase price of the Product.

15. Any action or lawsuit for breach of warranty must be commenced within eighteen (18) months following delivery of the Product.

16. Questions concerning this limited warranty may be directed to:

Nokia Customer Care Center, USA

Nokia Inc.

7725 Woodland Center Boulevard, Suite #150

Tampa, FL 33614

Telephone: 1-888-NOKIA2U (1-888-665-4228)

Facsimile: (813) 249-9619

TTY Users: 1-800-24NOKIA (1-800-246-6542)

17. The limited warranty period for Nokia supplied attachments and accessories is specifically defined within their own warranty cards and packaging.

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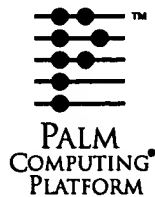
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Handbook for the Palm V™ Organizer



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3.5" Software Diskettes Available

Palm™ Desktop software is supplied on a CD-ROM disc. If you do not have access to a CD-ROM drive for your computer, you may download the Palm Desktop software from <http://www.palm.com>. Alternatively, you can order 3.5" diskettes by completing and mailing the diskette order card supplied in the Palm V™ organizer product package, or call to order the diskettes. See the Worldwide Customer Support card for the appropriate phone number.

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About This Book

Welcome to the Palm V™ connected organizer. This handbook is designed to help you get up and running quickly on your organizer. It describes all you need to know about how to use your Palm V organizer and the applications that come with it.

It walks you through:

- Locating all the parts of your organizer
- Viewing and entering data
- Using your organizer with your computer
- Personalizing your organizer with your own preference settings

After you become familiar with the basic functionality of your organizer, you can use the rest of this handbook as a reference for less common tasks, for maintaining your organizer, and also as a source of information if you have problems operating it.

Chapter 1

Introduction to Your Palm V™ Organizer

This chapter explains the physical buttons and controls on your Palm V™ connected organizer, how to use your organizer for the first time, and how to use HotSync® technology to synchronize your organizer and Palm™ Desktop organizer software.

Getting to know your Palm V organizer

What is a Palm V organizer?

With your Palm V organizer, you will no longer have trouble getting to meetings and appointments on time, remembering people's names and personal details, or tracking all the items on your to do list. Your organizer can help you improve your track record in all these areas, both at work and at home.

You can enter all your schedule details in Date Book so you can view them by the day, week, or month; you can even set an alarm to remind you of important meetings. Keep all your contact names, addresses, phone numbers, and other details in Address Book, so you can find them as soon as you need them. Add your tasks to To Do List, prioritize them so you don't overlook them, and assign them a due date.

To make sure you don't lose any of this important information, you can synchronize your data with Palm Desktop software on your computer so you always have a backup copy. You can set different levels of security for your organizer so unauthorized eyes cannot view your data.

When you are out of the office, track your expenses for your expense reports; then transfer the data to your computer to print it out. You can write, edit, and view your e-mail, and then synchronize your e-mail with your desktop E-Mail application when you return to your office.

System requirements

To install and operate Palm Desktop software, your computer system must meet the following requirements:

Minimum requirements

- Windows 95, Windows 98, or Windows NT 4.0
- IBM-compatible 486 computer or higher
- 8 MB RAM (memory) *minimum*,
16 MB recommended (required with Windows NT 4.0)
- 20 MB available hard disk space
- VGA monitor or better (the Quick Tour requires a 256 color video display)
- CD-ROM drive (you can also download the Palm Desktop software from <http://www.palm.com>, or order 3.5" diskettes from 3Com)
- Mouse
- One available serial port

Optional equipment

- Palm V™ Modem
- Windows-compatible printer
- Infrared communication device

Macintosh compatibility

You can connect your organizer to your Macintosh using the PalmConnect® Serial Kit or PalmConnect® USB Kit (sold separately).

Upgrade Information

If you already own a PalmPilot™ organizer or Palm III™ organizer, 3Com recommends that you install the version of Palm Desktop software that comes with your new Palm V organizer into the same folder as your current Palm Desktop software. When you install the new version in the same folder as the previous version, all your data is preserved. If you use another personal information manager (PIM), you still need to install Palm Desktop software in order to add HotSync Manager, conduit software, and other features of Palm Desktop software to your computer.

You perform HotSync operations in exactly the same way, so you can quickly synchronize your old data with your new organizer.

To upgrade:

1. Read the Getting Started guide for an overview of the complete installation process.
2. Synchronize your old organizer with your old Palm Desktop software. This ensures that the latest information from your organizer is on your desktop computer.
3. (Optional) To ensure against any data loss, go to the folder that stores Palm Desktop software, copy your username folder, and store the copy outside the Palm Desktop software folder.
4. Follow the installation instructions in “Installing Palm Desktop software” later in this chapter. Be sure to install the new software in the same folder as the old software.
5. To prepare for the first HotSync operation that synchronizes your new organizer with your new Palm Desktop software, go to the HotSync Manager and choose Custom.

Note: Be sure your username appears in the box at the top of the Custom dialog box. If not, select your username.

6. For all conduits, click Change and select the option Desktop overwrites handheld. Then click Done. See “Customizing HotSync application settings” in Chapter 6 for more information.
7. Place your new organizer in the cradle and press the HotSync button. If the Select User dialog box appears, select your username.

Note: If you customized the modem setup on your old organizer, you must re-enter the modem init string.

Each organizer must have a unique name

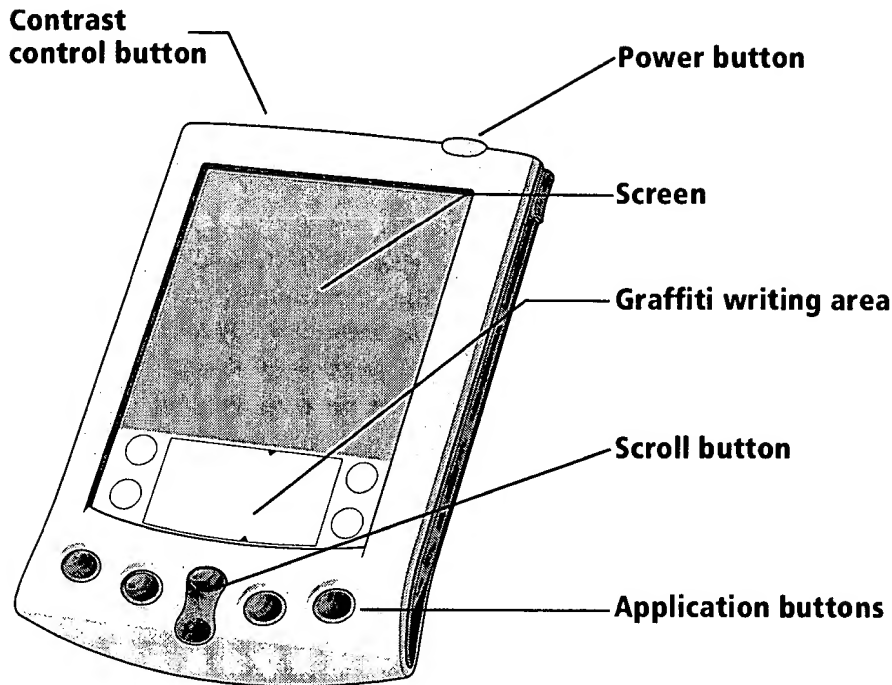
After you complete the upgrade process described above, you have two organizers with the same name. This is an undesirable situation. Each organizer must have a unique name in order to prevent unexpected results during HotSync operations and other complications.

We strongly recommend that you perform a hard reset on your old organizer. See “Performing a hard reset” in Appendix A for details.

A hard reset not only erases all data from the old organizer; it also erases the name and makes that organizer a clean slate, ready to receive a new name. The next time you perform a HotSync operation with this old organizer, you are asked to give it a name. Be sure to give it a unique name.

Palm V components

Locating front panel controls



Contrast control button

Turns on the onscreen contrast control so you can adjust the screen for the clearest screen display as required by the lighting conditions or temperature of the environment where you use your organizer. See "Using the onscreen contrast control" later in this chapter for more information.

Power button/ Backlight control

Turns your organizer on or off and controls the backlight feature.

If your organizer is turned off, pressing the power button turns the organizer on and returns you to the last screen you viewed. Press the power button to turn the organizer off.

If you have difficulty seeing the information onscreen, use the backlight to illuminate your screen. Press the power button and hold it down for about two seconds to turn the backlight on or off. You can assign the full-screen pen stroke to activate the backlight. See "Pen preferences" in Chapter 7 for more information.

Organizer screen	Displays the applications and information stored in your organizer. It is touch-sensitive and responds to the stylus.
Graffiti® writing area	The area where you write letters and numbers using the Graffiti® alphabet. See Chapter 2 to learn how to write Graffiti characters.
Scroll button	Displays text and other information that extends beyond the area of the organizer screen. Pressing the lower half of the scroll button scrolls down to view information below the viewing area, and pressing the upper half of the button scrolls up to view the information above the viewing area.
Application buttons	Activates the individual organizer applications that correspond to the icons on the buttons: Date Book, Address Book, To Do List, and Memo Pad. See “Buttons preferences” in Chapter 7 for details on reassigning these buttons to activate any application on your organizer.
	Tip: If your organizer is turned off, pressing any application button activates the organizer and opens the corresponding application.

Using the onscreen contrast control

Even with the backlight on, you may need to make further adjustments by changing the amount of contrast on the screen.

To adjust the contrast:

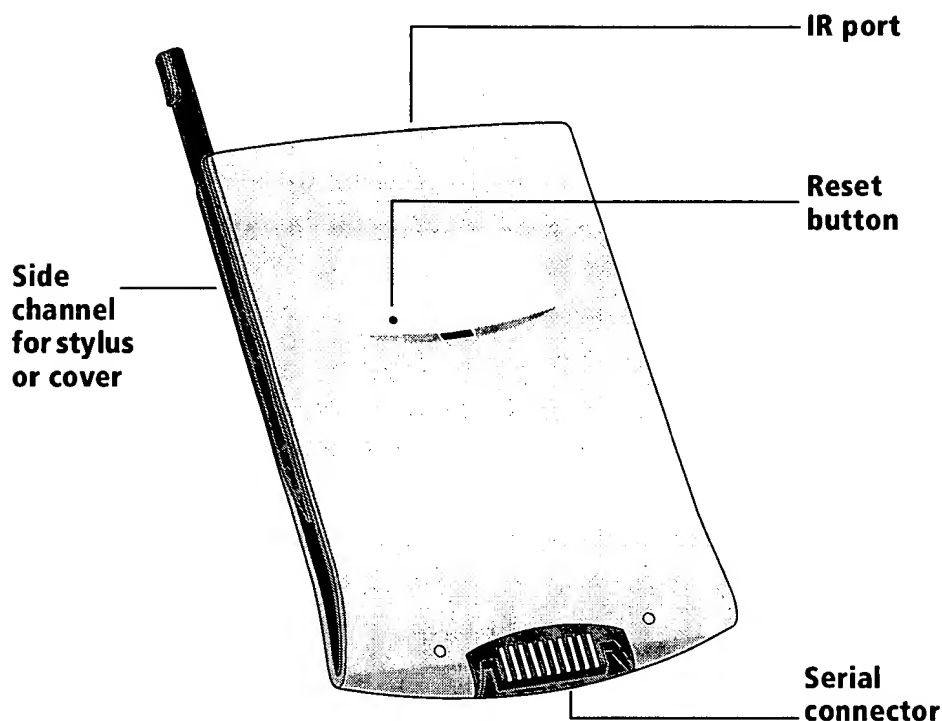
1. Press the Contrast control button.
2. To change the contrast in small increments, tap to the left or right of the slider.

To change the contrast in larger increments, drag the slider to the left or right.

Tip: You can also press the scroll button to move the slider incrementally.

3. Tap Done.

Locating back panel components



Side channels

Hold the stylus or front cover, which slide in and out of either side channel and click into place. To use the stylus, remove it from the side channel and hold it as you would a pen or pencil.

IR port

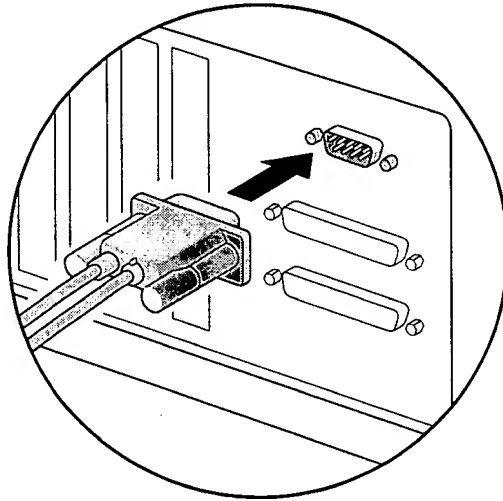
Uses infrared technology to transmit data to and receive data from other Palm Computing® platform handhelds, and to perform HotSync operations. See "Beaming information" in Chapter 5 and "IR HotSync operations" in Chapter 6 for more information.

Reset button

Under normal use, you should not have to use the reset button. See Appendix A for information about when and how to use the reset button.

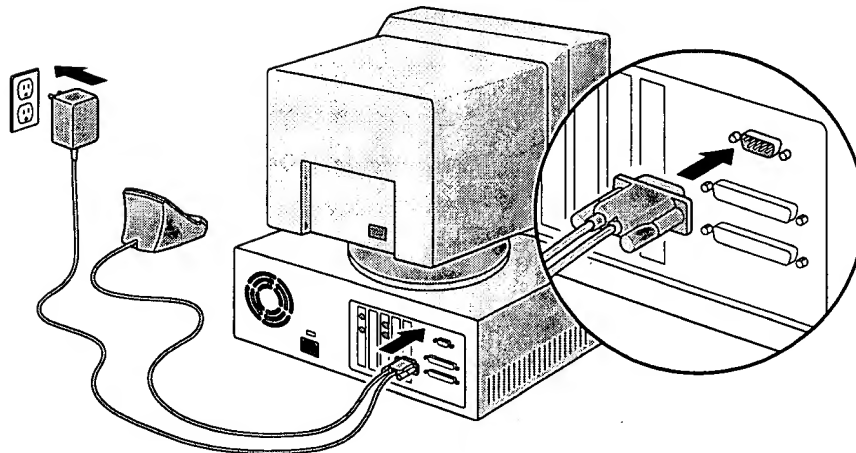
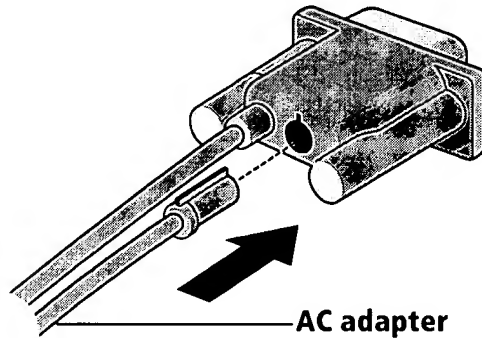
Serial connector Connects your organizer to the cradle, which in turn connects to the back of your computer and through the AC adapter to the wall current. This allows you to recharge your Palm V organizer as well as update the information between your organizer and computer using HotSync technology.

Note: The cradle must be plugged into the serial (COM) port at the back of your computer.



Your organizer requires a dedicated port. It cannot share a port with an internal modem or other device. If you are unsure about the exact location of the serial port on your computer, refer to the user's manual supplied with the computer.

An additional connection is made from the back of the cradle's serial (COM) port connector to the AC adapter which plugs into any AC current outlet.



Recharging the battery

The Palm V organizer contains a Lithium-ion battery that is recharged each time you place the organizer in the cradle. Just place your organizer in the cradle for four hours for an initial charge before you use it. Then place it in the cradle for a few minutes each day to recharge the battery to full capacity.

If the battery gets low, your organizer displays a warning message. If this occurs, perform a HotSync operation and then recharge the battery as soon as possible. If your organizer shuts down, you still have about a week to recharge the battery before you lose the data on your organizer.

Viewing data while in the cradle

You can set a preference so that you can continue to view data while your organizer is in the cradle and while the battery is being recharged. See “General preferences” in Chapter 7 for more information.

Palm Desktop organizer software

Palm Desktop software extends many of the functions of your organizer to your computer and serves to back up all your data. Viewing and editing your data using Palm Desktop software is optional. However, when you use it with your organizer and the built-in HotSync technology, you can fully synchronize the information on your organizer with the information on your computer.

It is a good idea to back up your data in case something happens to the data on your organizer. Changes you make on your organizer or Palm Desktop software appear in both places after you synchronize.

With Palm Desktop software, you can do the following:

- Work with your organizer applications on your computer. Palm Desktop software duplicates the Date Book, Address Book, To Do List, and Memo Pad applications on your organizer, so you can view, enter, and modify any data stored on your organizer.
- Back up the data stored on your organizer with HotSync technology and synchronize the data on your Palm Desktop software. Synchronization is a one-step procedure that ensures your data is always safe and up-to-date. See “Exchanging and updating data: HotSync operations” in Chapter 4 for more information.
- Import and export data, so you can easily transfer data from other desktop applications into any of your main applications. See “Importing data” in Chapter 2 for more information.
- Print your Date Book, Address Book, To Do List, and Memo Pad information on any printer.

Installing Palm Desktop software

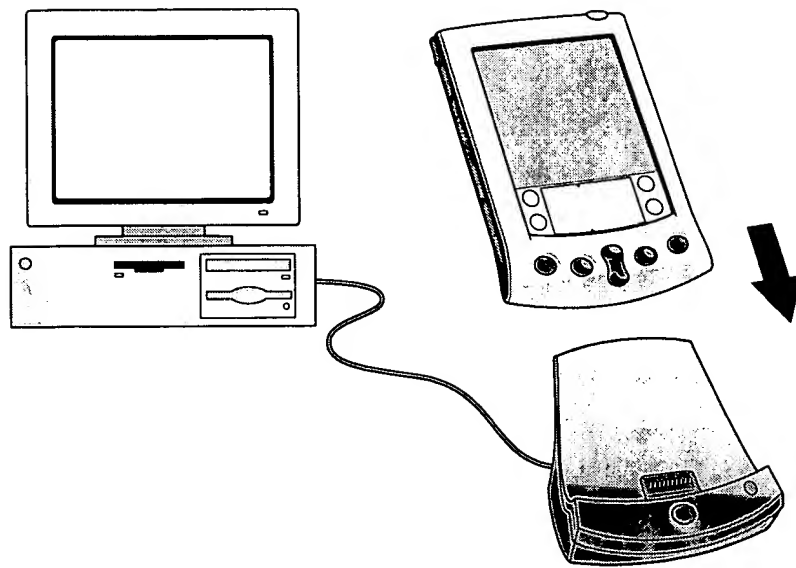
The following instructions guide you through installing Palm Desktop software. After installation, refer to the online Help in Palm Desktop software for information about how to use the software.

To ensure a safe and uninterrupted installation of Palm Desktop software, please do the following before installing:

- Turn off your computer and connect the cradle to it.
- If you are installing from diskettes (rather than the CD-ROM included in the box), make sure the original Palm Desktop software diskettes are write-protected, and then make backup copies of them. When you finish, use the copies to install the software, and store the original diskettes in a safe place. Refer to your computer's manual or operating system documentation if you need information about locking or copying diskettes.
- Do *not* simply copy the Palm Desktop software files to your computer's hard disk. You must use the installer to place the files in their proper locations and to decompress the files.

To install Palm Desktop software:

1. Exit any open programs, including those that run automatically at startup such as Microsoft Office, and disable any virus-scanning software.
2. Insert the Palm Desktop software CD-ROM into the computer's CD-ROM drive (or insert the diskette labeled Setup into the diskette drive).
3. When the Palm Desktop Installer Menu appears, click the Install button to begin the installation procedure.
4. Follow the onscreen instructions to complete the installation. During installation you will be asked to insert your organizer into the cradle.



Using your organizer with another PIM

If you prefer to use another personal information manager (PIM), such as Microsoft Outlook, you still need to install Palm Desktop software in order to add HotSync Manager, the connection software, and other features of Palm Desktop software to your computer. The connection software, called a conduit, lets you synchronize the data between your organizer and your PIM.

If the installation program detects that you have Microsoft Outlook on your computer, the program lets you choose between installing Palm Desktop software or installing the conduit for Outlook so that you can use that application as your PIM.

For information on the availability of conduit software for the PIM you use, contact the vendor of your PIM or visit the web site <http://www.palm.com>.

Tapping and typing

Tap with the stylus to get things done

Like using a mouse to click elements on a computer screen, using the stylus to tap elements on your organizer screen is the basic action that gets things done on your organizer.

The first time you start your organizer, setup instructions appear on the screen. These instructions include a calibration screen, or digitizer. Calibration aligns the internal circuitry of your organizer with its touch-sensitive screen so that when you tap an element on the screen, the organizer can detect exactly which task you want to perform.

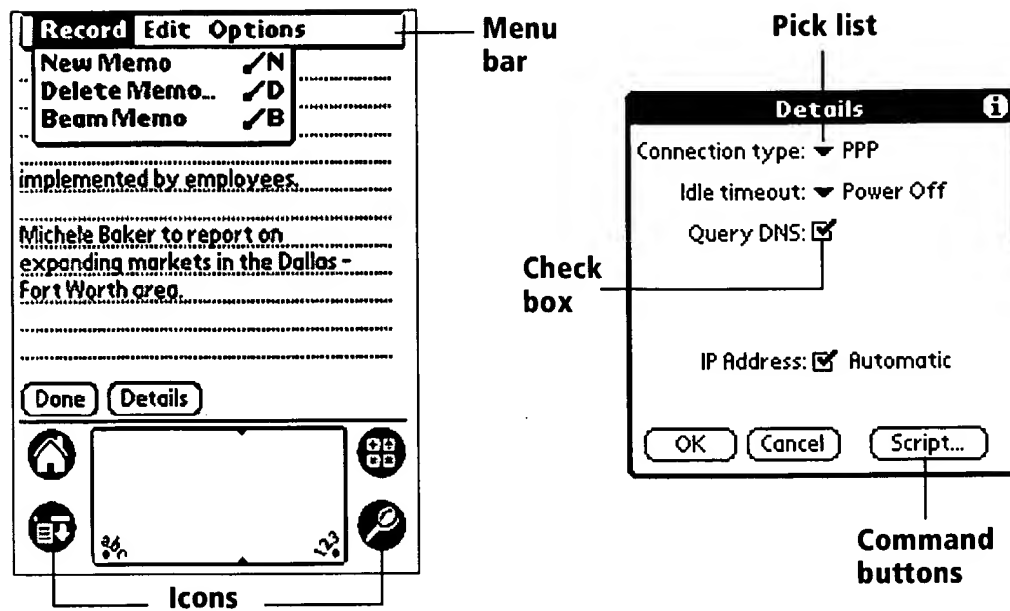
Important: Always use the point of the stylus for tapping or making strokes on the organizer screen. Never use an actual pen, pencil, or other sharp object to write on the organizer screen.

With your organizer turned on, you can tap the organizer screen to do many operations, such as the following:

- Open applications
- Choose menu commands
- Initiate a global Find operation
- Select options in dialog boxes
- Open the onscreen keyboards





Just as you can drag the mouse to select text or move objects on your computer, you can also drag the stylus to select text. You can also use the stylus to drag the slider of any scroll bar.

Elements of the organizer interface



Menu bar A set of commands that are specific to the application. Not all applications have a menu bar.

Command buttons Tap a button to perform a command. Command buttons appear in dialog boxes and at the bottom of application screens.

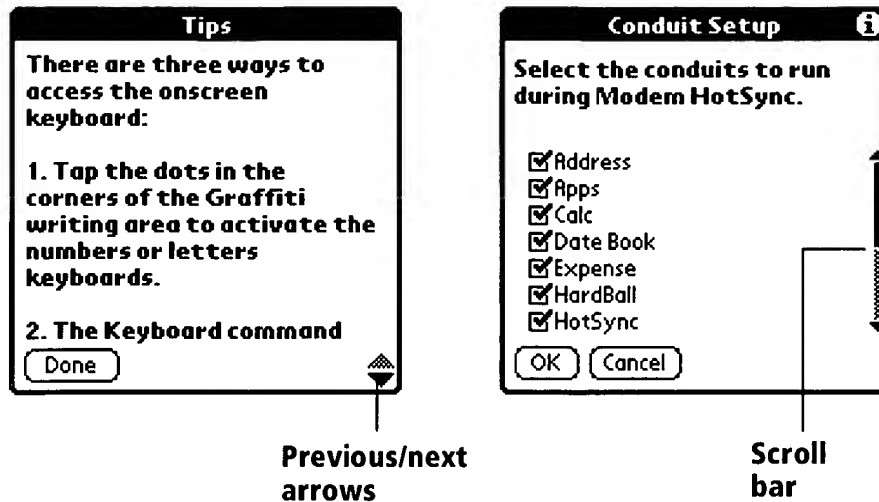
Icons Tap the icons to open applications , menus , Calculator , and to find text anywhere in your data .

abc With the cursor in an input field, tap the dot to activate the alphabetic keyboard.

123 With the cursor in an input field, tap the dot to activate the numeric keyboard.

Check box When a check mark appears in a check box, the corresponding option is active. If a check box is empty, tapping it inserts a check mark. If a check box is checked, tapping it removes the check mark.

Pick list Tap the arrow to display a list of choices, and then tap an item in the list to select it.



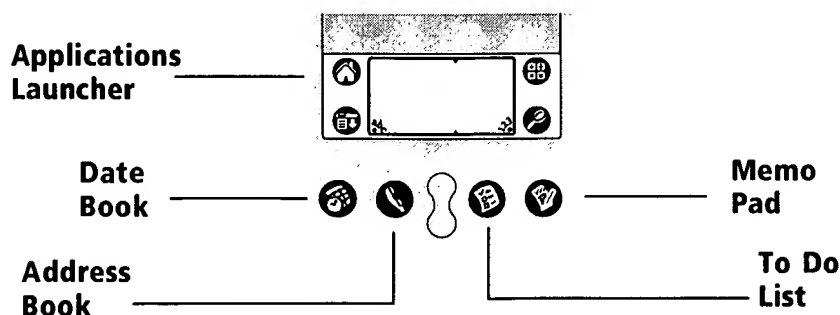
Scroll bar Drag the slider, or tap the top or bottom arrow, to scroll the display one line at a time. To scroll to the previous page, tap the scroll bar just above the slider. To scroll to the next page, tap the scroll bar just below the slider.

You can also scroll to the previous and next pages by pressing the upper and lower portions of the scroll button on the front panel of the organizer.

Next/previous arrows Tap the up and down arrows to display the previous and next page of information; tap the left and right arrows to display the previous and next record.

Opening applications


You can use the Applications Launcher to open any application installed on your organizer. You can also open the four main applications — Date Book, Address Book, To Do List, and Memo Pad — with the application buttons on the front panel of your organizer.



Tip: When you press an application button on the front panel, you have instant access to the selected application. You don't even need to turn on your organizer first.

In addition to providing a way for you to open applications, the Applications Launcher displays the current time, battery level, and application category.

To open an application:

1. Tap the Applications icon .



2. Tap the icon of the application that you want to open. If you have many applications installed on your organizer, tap the scroll bar to see all of your applications.


Tip: To find an application quickly, you can write the Graffiti character for the first letter of its name. The Applications Launcher scrolls to the first application with a name that begins with that letter. You can also assign application icons to different categories. See "Categorizing applications" in Chapter 3.

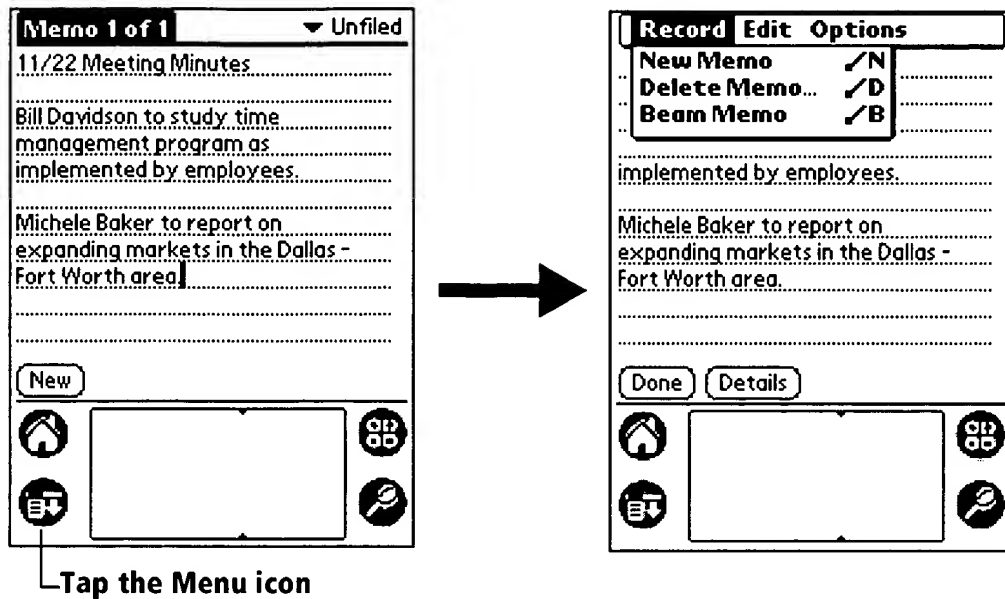
Using menus

Menus on your organizer are easy to use. Once you have mastered them in one application, you can use them the same way in all other applications.

The menus of each application are illustrated in the section on that application in Chapter 4. The Edit menu is described in "Editing records" in Chapter 4.

To open the menu bar:

1. Open an application (such as Memo Pad).
2. Tap the Menu icon .



In this example, three menus are available: Record, Edit, and Options. The Record menu is selected and contains the commands New Memo, Delete Memo, and Beam Memo.

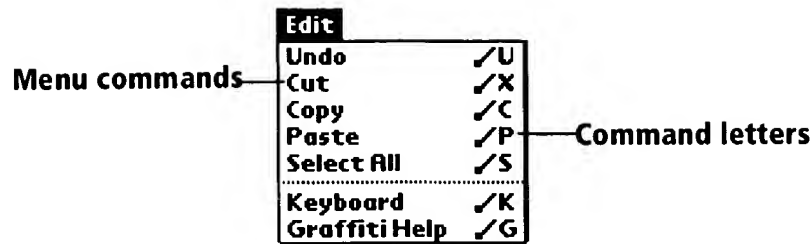
Choosing a menu

After you open the menu bar for an application, tap the menu that contains the command you want to use.

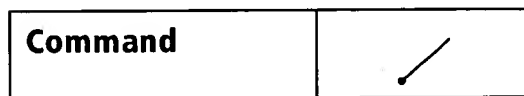
The menus and menu commands that are available depend on the application that is currently open. Also, the menus and menu commands vary depending on *which part* of the application you're currently using. For example, in Memo Pad, the menus are different for the Memo List screen and the Memo screen.

Graffiti menu commands

Most menu commands have an equivalent Graffiti Command stroke, which is similar to the keyboard shortcuts used to execute commands on computers. The command letters appear to the right of the command names.



To use the Graffiti menu commands, the menu bar must be closed. Draw the Command stroke anywhere in the Graffiti area, and immediately write the corresponding command letter in the Graffiti letter area. When you draw the Command stroke, the word "Command" appears just above the Graffiti writing area to indicate that you are in Command mode.



For example, to choose Select All in the Edit menu, draw the Command stroke, followed by the letter "s."

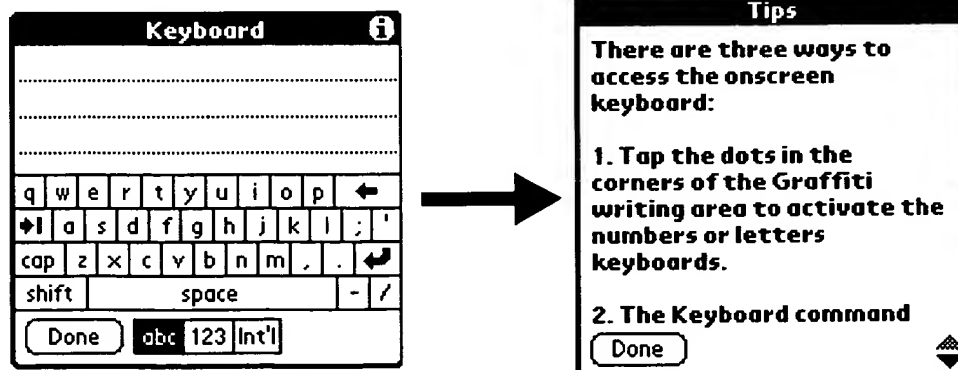
Note: Command mode is active for approximately two seconds, so you must write the command letter immediately to choose the menu command.

Displaying online tips

Many of the dialog boxes that appear on your organizer contain an online Tips icon in the upper-right corner. Online tips anticipate questions you have in a dialog box, provide shortcuts for using the dialog box, or give you other useful information.

To display an online tip:

1. Tap the Tips icon ⓘ.
2. After you review the tip, tap Done.



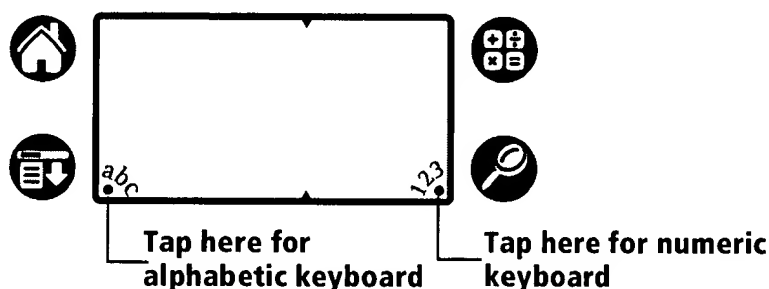
Three ways to enter data

There are three ways to enter data into your organizer:

- Using the onscreen keyboard
- Using Graffiti writing
- Entering or importing data in Palm Desktop software and then synchronizing with your organizer

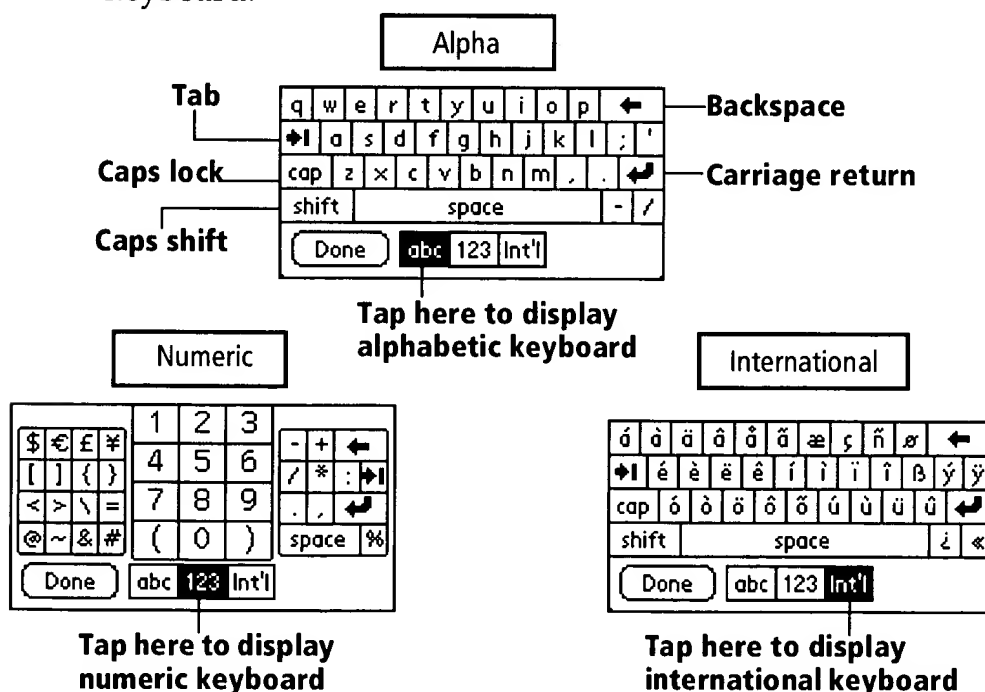
Onscreen keyboard

When you create or edit a record in an application such as Address Book, you can open the onscreen alphabetic and numeric keyboards to enter data.



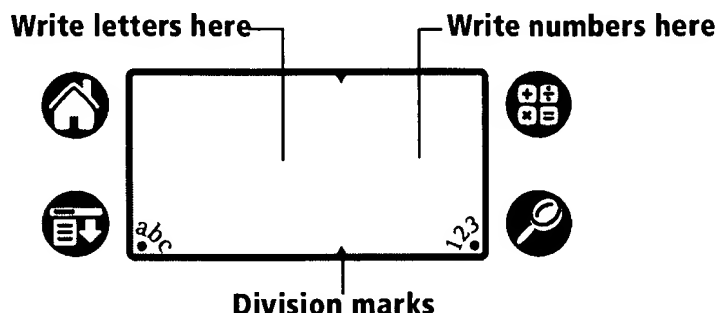
After a keyboard is open, you can tap to open any of the other keyboards, including the international keyboard. See “Using the onscreen keyboard” in Chapter 2 for more information.

Note: You cannot enter Graffiti characters while using the onscreen keyboard.




Graffiti writing

Your organizer includes Graffiti writing software as the primary system for entering text and numbers. With Graffiti writing, you write simple strokes with the stylus and they are instantly recognized as letters or numbers.

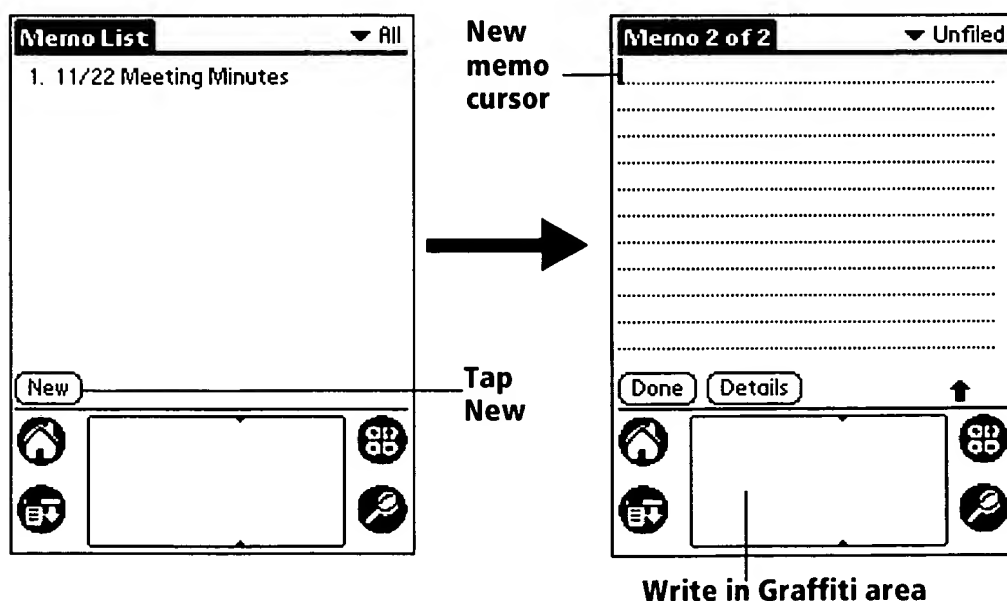


The Palm Desktop software CD-ROM includes Giraffe, a game you can use to practice Graffiti writing. See "Installing and removing applications" in Chapter 3 for installation instructions. The Memo Pad application is ideal for practicing Graffiti writing. This section explains how to open Memo Pad and use it to practice Graffiti writing.

To open Memo Pad:

1. Press the Memo Pad application button .
2. Tap New.

Note: A blinking cursor appears on the first line of the new memo to indicate where new text will appear.

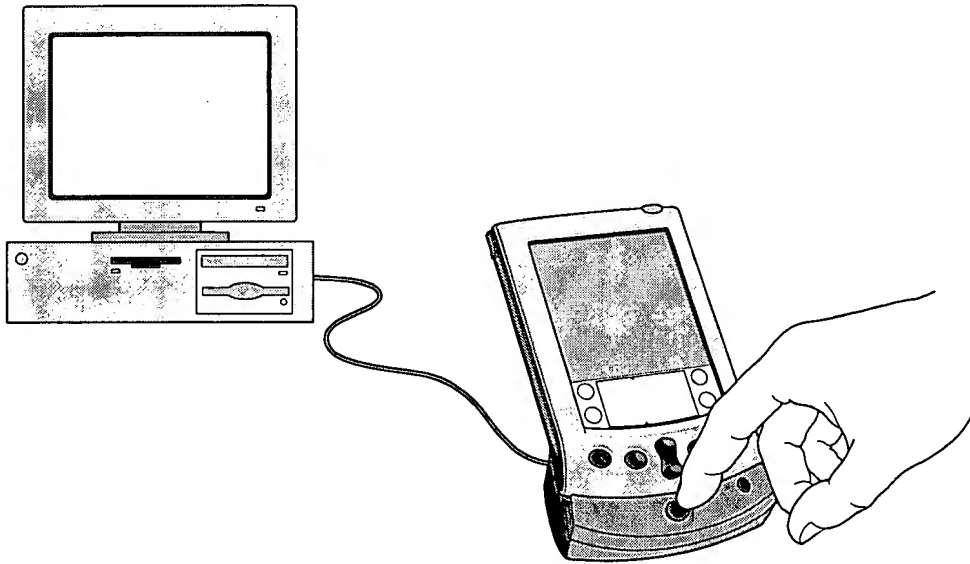


See "Using Graffiti writing to enter data" in Chapter 2 for details.

Using Palm Desktop software

If you have new records you want to add to your organizer and prefer to use the computer keyboard rather than Graffiti writing or the onscreen keyboard, enter the data in Palm Desktop software or the PIM you have installed to use with your organizer.

After the information is in Palm Desktop software, perform a HotSync operation to synchronize your organizer with your computer. See "Exchanging and updating data: HotSync operations" in Chapter 4 for more information.





Importing data

If you already have data in a database on your computer, you can import it into Palm Desktop software. You can import data stored in computer applications such as spreadsheets and databases, or from another Palm Computing platform handheld. When you import data, you transfer the records to your organizer without having to enter them manually. See "Importing data" in Chapter 2 for more information.

Customizing your organizer

You can customize your organizer by using the Preferences application. You can enter personal information such as your name and address; change the time and date; view different date and time formats when you travel; turn off sounds; and configure your organizer to work with a modem or network. See Chapter 7 for more information on customizing your organizer.

To open the Preferences screens:

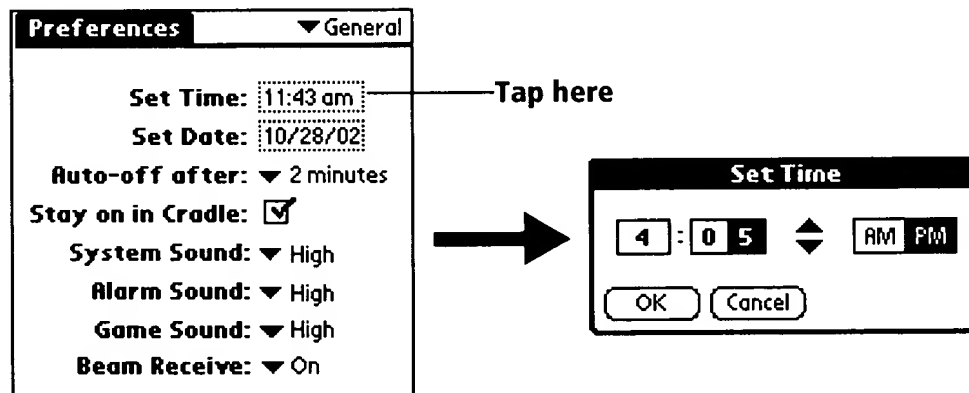
1. Tap the Applications icon .
2. Tap the Preferences icon .
3. Tap the category pick list in the upper-right corner of the screen.
4. Tap the Preferences category you want to view.

The following procedures for setting the time and date give you an example of how to customize your organizer.

You make changes to the time and date in General preferences.

To set the current time:

1. Tap the Set Time box.



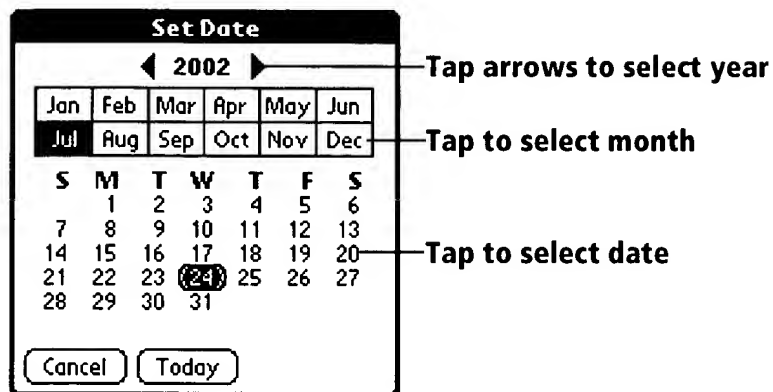
2. Tap the up or down arrows to change the hour.
3. Tap each number of the minute, and then tap the arrows to change them.
4. Tap AM or PM.

Note: Your organizer can also display time based on a 24-hour clock. See "Formats preferences" in Chapter 7 for more information.

5. Tap OK.

To set the current date:

1. Tap the Set Date box.
2. Tap the arrows to select the current year.



3. Tap a month.
4. Tap the current date.

Chapter 2

Entering Data in Your Palm V™ Organizer

This chapter explains how to enter data into your Palm V™ organizer by writing with the stylus in the Graffiti® writing area, by using the onscreen keyboard, by using the computer keyboard, or by importing data from another application.

Using Graffiti writing to enter data

Chapter 1 introduced Graffiti writing and briefly described how to use it to enter text in your applications. In this section, you learn the procedures for creating letters, numbers, punctuation, and symbols, as well as some Graffiti tips and tricks.

Writing Graffiti characters

Most people find they can enter text quickly and accurately with only minutes of practice. Graffiti writing includes any character you can type on a standard keyboard. The Graffiti strokes closely resemble the uppercase letters of the regular alphabet, which makes Graffiti writing easy to learn.

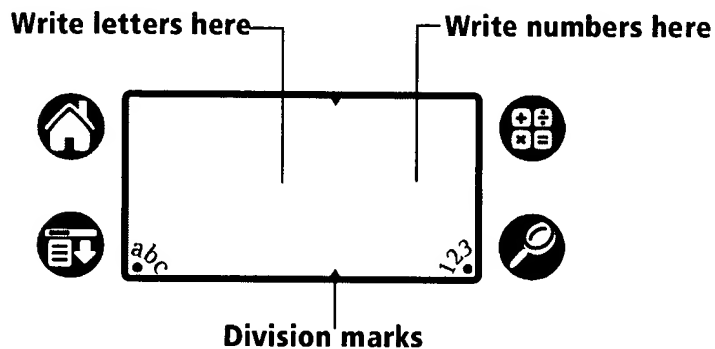
There are four basic concepts for success with Graffiti writing:

- If you draw the character shape exactly as shown in the tables later in this chapter (like the shapes shown in the following diagram), you achieve 100% accuracy.



- The heavy dot on each shape shows where to begin the stroke. Certain characters have similar shapes, but different beginning and end points. Always begin the stroke at the heavy dot (you should not create the heavy dot; it is only there to show you where to begin the stroke).

- Most characters require only a single stroke. When you lift the stylus from the Graffiti writing area, your organizer recognizes and displays the text character immediately. To accomplish single strokes, some Graffiti strokes are portions of the regular alphabet equivalents.
- The Graffiti writing area is divided into two parts: one for writing the letters of the alphabet and one for writing numbers. The small marks at the top and bottom of the Graffiti writing area indicate the two areas.



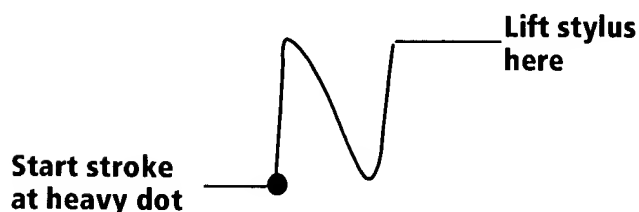
To write Graffiti letters:

1. Tap the screen where you want your text to go.

Note: You need to tap above the Graffiti writing area, and must see a blinking cursor before you write the text.

2. Use the tables on the following pages to find the stroke shape for the letter you want to create. For example, the stroke shown below creates the letter "n."

Note: There are two different stroke shapes available for some letters. For these letters, choose the one that's easiest for you.



As you'll see later, you use the same shape to create both the uppercase and lowercase version of a letter.

3. Position the stylus in the left-hand side of the Graffiti writing area.

4. Start your stroke at the heavy dot and draw the stroke shape as it appears in the tables.
5. Lift the stylus from the screen at the end of the stroke shape.

That's all there is to it! When you lift the stylus from the screen, your organizer recognizes your stroke immediately and prints the letter at the insertion point on the screen.

As soon as you lift the stylus from the screen, you can begin the stroke for the next character you want to write.



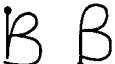



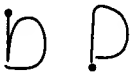


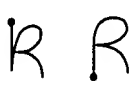
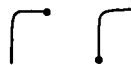

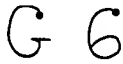










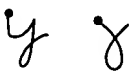





Important: You must begin the character strokes in the Graffiti writing area. If you do not make Graffiti strokes in the Graffiti writing area, your organizer does not recognize them as text characters.

Graffiti tips

When using Graffiti writing, keep these tips in mind:

- Accuracy improves when you write large characters. You should draw strokes that nearly fill the Graffiti writing area.
- To delete characters, simply set the insertion point to the right of the character you want to delete and make the backspace stroke (a line from right to left) in the Graffiti writing area.
- Write at natural speed. Writing too slowly can generate recognition errors.
- Do not write on a slant. Vertical strokes should be parallel to the sides of the Graffiti writing area.
- Press firmly.

The Graffiti alphabet

Letter	Strokes	Letter	Strokes
A		N	
B		O	
C		P	
D		Q	
E		R	
F		S	
G		T	
H		U	
I		V	
J		W	
K		X	
L		Y	
M		Z	
Space		Back Space	
Carriage Return		Period	<i>tap twice</i>

Writing capital letters

You make capital letters with the same stroke shapes as the basic alphabet characters. To make capital letters, you must first “shift” to caps — just as you press the Shift key on a keyboard — and then write the character strokes.

Note: Graffiti writing includes a feature that automatically capitalizes the first letter when you create a new sentence or a new record (by tapping New or a blank line).

To draw the first letter of a word as a capital letter:

- Use the Caps Shift stroke:

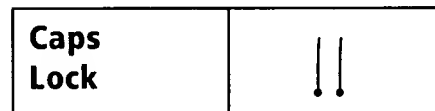


Tip: When Caps Shift is active, an “up arrow” symbol appears in the lower-right corner of the organizer screen. If you accidentally activate Caps Shift, backspace will cancel it.

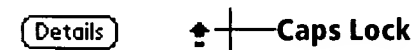


To enter only capital letters (Caps Lock):

- Use the Caps Lock stroke:



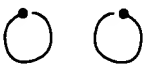
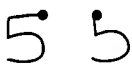








Tip: When Caps Lock is active, an underlined “up arrow” symbol appears in the lower-right corner of the organizer screen. To return to lowercase, make the Caps Shift stroke.



Writing numbers

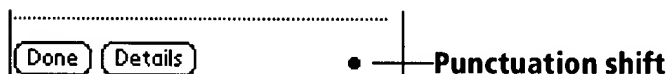
Writing numbers with Graffiti writing is similar to writing letters of the alphabet, except that you make the character strokes on the right-hand side (numbers side) of the Graffiti writing area.

Graffiti numbers

Number	Strokes	Number	Strokes
0		5	
1		6	
2		7	
3		8	
4		9	

Writing punctuation marks

Graffiti writing can create any punctuation symbol that you can enter from a standard keyboard. All punctuation marks begin with a single tap on the Graffiti writing area. When you make this tap, you activate Punctuation Shift and a dot appears to show it is active. The next stroke you make with the stylus creates a punctuation mark.



Note: When Punctuation Shift is active, you can make a symbol stroke anywhere in the Graffiti writing area (the letters *or* numbers side).

Symbol	Stroke	Symbol	Stroke
Period .	•	Dash —	—
Comma ,	,	Left Paren ((
Apostrophe '	'	Right Paren))
Question ?	?	Slash /	/
Exclamation !	!	Dollar \$	\$

Additional Graffiti punctuation

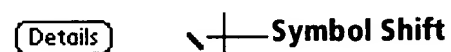
@	#	%	^	&	*	<	>	_	+	=	
@	#	%	^	&	*	<	>	_	+	=	
\	{	}	[]	~	`	;	:	"	tab	
\	{	}	[]	~	`	;	:	"	tab	

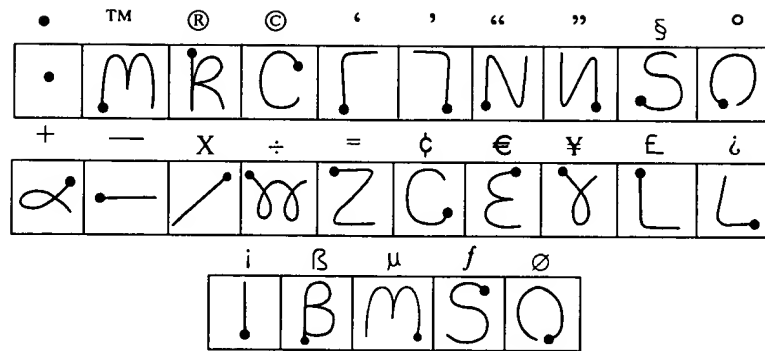
Writing symbols and extended characters

All symbols and extended characters begin with the stroke in the Graffiti writing area of your organizer:

Symbol Shift	↘
--------------	---

When the Symbol Shift is active, a slanted shift symbol appears in the lower-right corner of the screen. The next stroke that you make creates the symbol or extended character.

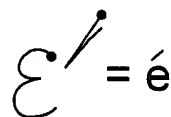




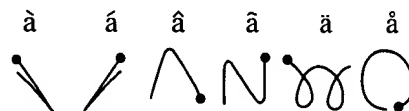
Writing accented characters

To create accented characters, draw the stroke normally used to create the letter, followed by an accent stroke. Graffiti writing then adds the accent to the letter.

For example, the following diagram shows the strokes required to draw an accented “e.”



Accent strokes

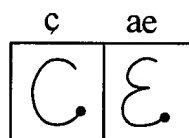


Using these accent strokes, you can write the following accented letters:

à á â ã ä å è é ê ì í î ï ò ó ô õ ö ù ú û ü ÿ ý ñ

Additional non-English characters






You can write the following characters without any special punctuation or shifting:



Note: You must write these non-English characters in the left side of the Graffiti writing area.

Navigation strokes

In addition to character symbols, Graffiti writing includes special strokes that you can use to navigate within text or fields in your applications.


Command	Stroke
Move cursor right	
Move cursor left	
Previous field (Address Book only)	
Next Field (Address Book only)	
Open Address Record (Address Book only)	

Graffiti ShortCuts

Graffiti ShortCuts make entering commonly used words or phrases quick and easy. ShortCuts are similar to the Glossary or Autotext features of some word processors.

Graffiti writing comes with several predefined ShortCuts, and you can also create your own. Each ShortCut can represent up to 45 characters. For example, you might create a ShortCut for your name, or for the header of a memo. See "ShortCuts preferences" in Chapter 7 to learn about creating your own ShortCuts.

To use a ShortCut, draw the ShortCut stroke followed by the ShortCut characters. When you draw the ShortCut stroke, the ShortCut symbol appears at the insertion point to show that you are in ShortCut mode.

ShortCut	
----------	---

Your organizer includes the following predefined Graffiti ShortCuts:

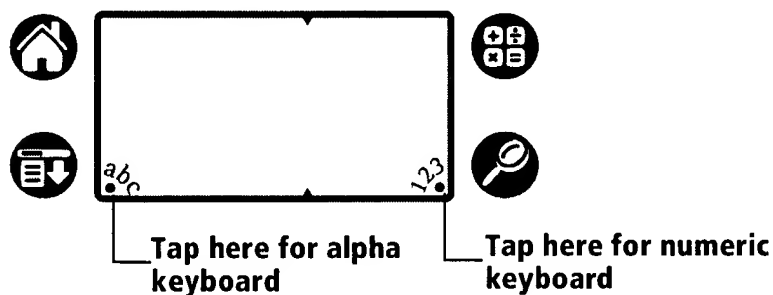
Entry	ShortCut
Date stamp	ds
Time stamp	ts
Date / time stamp	dts
Meeting	me
Breakfast	br
Lunch	lu
Dinner	di

Using the onscreen keyboard

You can open the onscreen keyboard anytime you need to enter text or numbers on your organizer. Note that you cannot enter Graffiti characters while using the onscreen keyboard.

To use the onscreen keyboard:

1. Open any application (such as Memo Pad).
2. Tap any record, or tap New.
3. Tap "abc" to open the alphabetic keyboard, or tap "123" to open the numeric keyboard.



4. Tap the characters to enter text and numbers.

Note: The onscreen keyboard also includes a dialog box for international characters. You can switch among the three dialogs at any time to enter the exact text you need.

5. After you finish, tap Done to close the onscreen keyboard and place the text in the record.

Using your computer keyboard

If you have a lot of data to enter, or prefer to use the computer keyboard, you can use Palm™ Desktop software or any supported PIM to enter information. You can then perform a HotSync® operation to synchronize the information on your computer with the information on your organizer. All the main applications on your organizer are also available in Palm Desktop software and in most PIMs, so you don't need to learn different applications.

Refer to Palm Desktop online Help for more information on entering data on your computer.

Importing data

If you have data stored in computer applications such as spreadsheets and databases, or if you want to import data from another organizer, you can transfer the data to your organizer without having to key it in manually. Save the data in one of the file formats listed below, import it into Palm Desktop software, and then perform a HotSync operation to transfer the data to your organizer.

Palm Desktop software can import data in the following file formats:

- Comma delimited (.csv, .txt): Address Book and Memo Pad only
- Tab delimited (.tab, .tsv, .txt): Address Book and Memo Pad only
- CSV (Lotus Organizer 2.x/97 Mapping): Address Book only
- Date Book archive (.dba)
- Address Book archive (.aba)
- To Do List archive (.tda)
- Memo Pad archive (.mpa)

Archive formats can only be used with Palm Desktop software. Use the archive file formats to share information with other people who use a Palm Computing® platform handheld or to create a copy of your important Palm Desktop information.

To import data:

1. Open Palm Desktop software.
2. Click the application into which you want to import data.
3. If you are importing records that contain a field with category names, do the following:

Select All in the Category box.

Be sure that the same categories that appear in the imported file also exist in the application. If the categories do not exist, create them now; otherwise, the records are imported into the Unfiled category.

4. From the File menu, choose Import.
5. Select the file you want to import.
6. Click Open.
7. To import data into the correct Palm Desktop fields, drag fields in the left-hand column so that they are opposite the corresponding imported field on the right.
8. If you do not want to import a field, deselect the check box for that field.
9. Click OK.

The imported data is highlighted in the application.

10. To add the imported data to your organizer, perform a HotSync operation.

See Palm Desktop online Help for more information on importing and exporting data.

Chapter 3

Managing Your Applications

This chapter explains how to switch between applications on your Palm V™ organizer, how to change application settings so they are personalized to your work methods, and how to categorize applications so you view them in related groups.


Using the Applications Launcher

To open the Applications Launcher, tap the Applications icon .

Selecting applications

Your organizer is equipped with a variety of applications. All the applications installed on your organizer appear in the Applications Launcher. See “Opening applications” in Chapter 1 for details.



Switching between applications

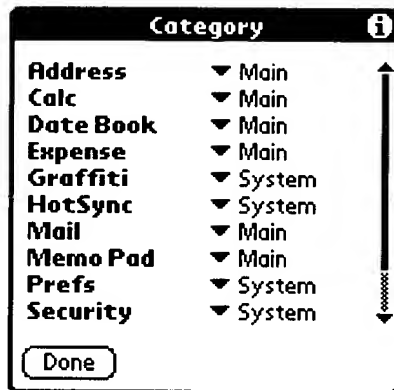
When working in any application, tap the Applications icon  or press an application button on the front panel of your organizer to switch to another application. Your organizer automatically saves your work in the current application and displays it when you return to that application.

Categorizing applications

The category feature enables you to manage the number of application icons that appear onscreen in the Applications Launcher. You can assign an application to a category and then display a single category or all your applications.

To categorize an application:


1. Tap the Applications icon .
2. Tap the Menu icon .
3. Tap App, and then tap Category.
4. Tap the pick list next to each application to select a category.



Tip: To create a new category, tap Edit Categories from the pick list. Tap New, enter the category name, and then tap OK to add the category. Tap OK.

5. Tap Done.

To display applications by category:

1. Tap the Applications icon .
2. Do one of the following:



Tap the Applications icon repeatedly to cycle through all your categories.

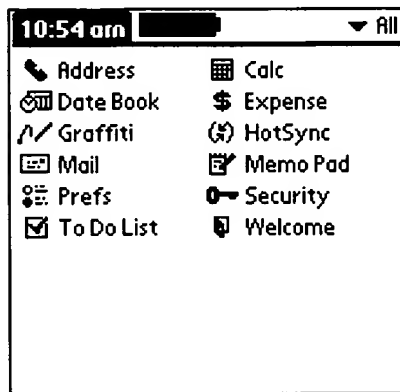
Tap the pick list in the upper-right corner of the screen and select the category you want to display.

Changing the Applications Launcher display



By default, the Applications Launcher displays each application as an icon. As an alternative, you can choose to show a list of applications. You can also choose to view the same category of applications each time you open the Applications Launcher.

To change the Applications Launcher display:

1. Tap the Applications icon .
2. Tap the Menu icon .
3. Tap Options, and then tap Preferences.
4. Tap the View By pick list and select List.
5. Tap OK.




To open the Applications Launcher to the last opened category:

1. Tap the Applications icon .
2. Tap the Menu icon .
3. Tap Options, and then tap Preferences.
4. Tap the Remember Last Category check box to select it.
5. Tap OK.

Choosing preferences

You can set options that affect an entire application in the application's Preferences dialog box.

To change preferences for an application:

1. Open an application.
2. Tap the Menu icon .
3. Tap Options, and then tap Preferences.

Note: Not all applications have a Preferences command.

4. Make changes to the settings.
5. Tap OK.

Installing and removing applications

This section explains how to install and remove applications on your organizer and how to remove Palm™ Desktop software from your computer.

Installing add-on applications

Your organizer comes with the Date Book, Address Book, To Do List, Memo Pad, Expense, Calculator, and Mail applications installed and ready to use.

You can also install additional applications on your organizer, such as games and other software. The Install Tool makes it easy to install software on your organizer during a HotSync® operation. There are a variety of third-party applications available for your organizer. To learn more about these applications, go to the web site:
<http://www.palm.com>.

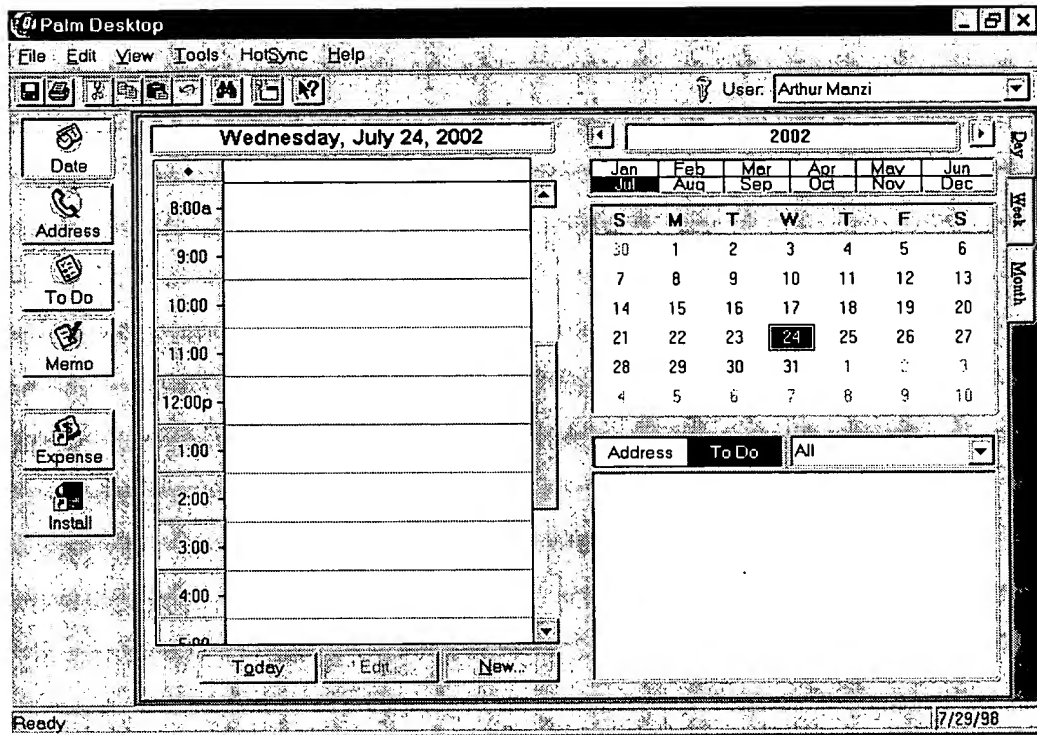
Note: Any game or application that you install on your organizer resides in RAM memory; you can delete them at any time.

To install add-on software on your organizer:

1. On your computer, copy or download the application you want to install into the add-on folder in your Palm Desktop directory on your computer.

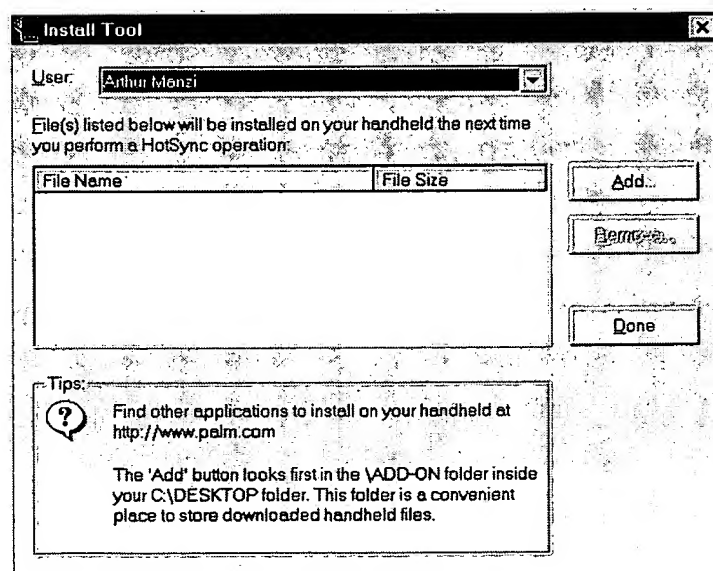
Note: If the software you download is compressed, you need to decompress it into this folder. If you prefer to place the application into another folder, you need to navigate to that folder before you complete step 5.

2. Double-click the Palm Desktop icon on your desktop.

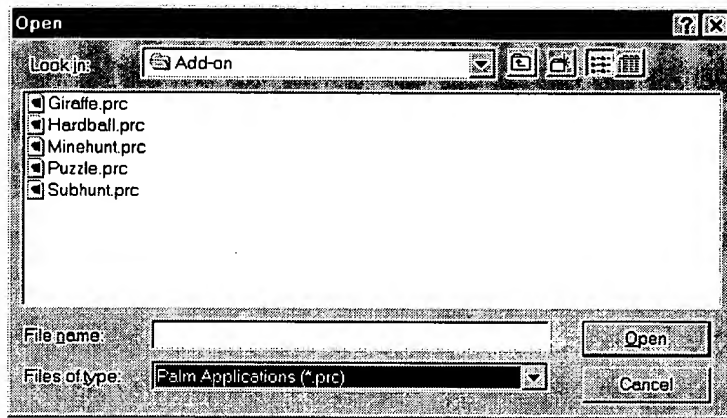


3. Click Install.

Tip: You can also access the Install Tool dialog by selecting Install Tool from the Palm Desktop program group or by double-clicking any file with a PRC file extension.



4. In the User drop-down list, select the name that corresponds to your organizer.
5. Click Add.



6. Select the application(s) that you want to install on your organizer.
7. Click Open.

Note: Review the list of applications you selected in the Install Tool dialog box. If you do not want to install an application, select it, and then click Remove. (This does not remove the application from your computer; it simply removes it from the list of applications to install.)

8. Perform a HotSync operation to install the application(s) you selected in step 6. See "Exchanging and updating data: HotSync operations" in Chapter 4 for details.

Installing games

The CD-ROM also includes several games that you can install with the Install Tool:

- Giraffe
- HardBall
- MineHunt
- Puzzle
- SubHunt



Note: Giraffe is a fun, easy way for you to practice Graffiti® writing.

After you install and start a game, the instructions appear in the Game menu. Depending on the game, the Game menu may also contain commands to show high scores, to start a new game, or to set preferences for the game.

Removing applications

In the event that you run out of memory or decide that you no longer need an application you installed, you can remove applications from your organizer. You can remove only add-on applications, patches, and extensions that you install; you cannot remove the applications that reside in the ROM portion of your organizer.

To remove an add-on application:

1. Tap the Applications icon .
2. Tap the Menu icon .
3. Tap App, and then tap Delete.
4. Tap the application that you want to remove.



5. Tap Delete.
6. Tap Yes.
7. Tap Done.

Removing Palm Desktop software

If you no longer want to use Palm Desktop software, you can remove it from your computer.

To remove Palm Desktop software:

1. From the Windows Start menu, choose Settings, and then Control Panel.
2. Double-click the Add/Remove Programs icon.
3. On the Install/Uninstall tab, select Palm Desktop software.
4. Click Add/Remove.

Note: You need to install the HotSync Manager from the installation CD if you want to synchronize data with another PIM.

Security

Your organizer comes with a Security application so that unauthorized users cannot view the entries you wish to protect.


In Security, you can do the following:

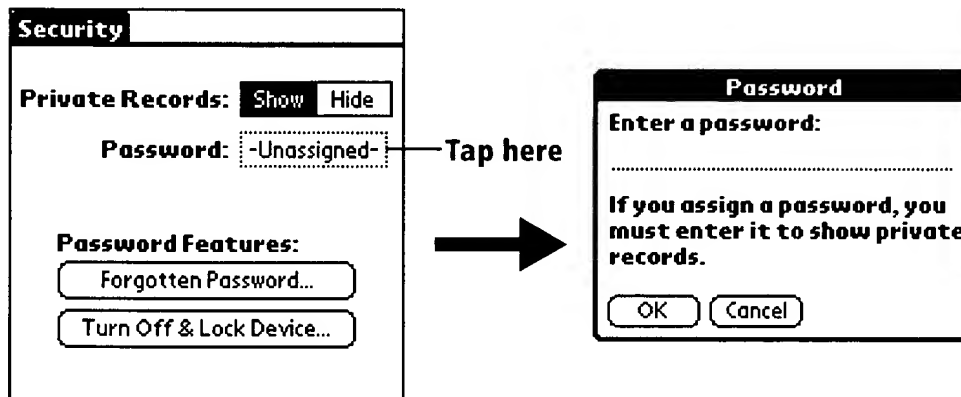
- Turn off and lock your organizer so that it does not operate until you enter the correct password.
- Hide records that you mark as private. You can hide private records with or without a password. Without a password, private records are hidden until you set the Security application to show them. With a password, you must enter the password to view the private entries. See "Making records private" in Chapter 4 for information on making records private.

Assigning a password

You can assign a password to protect your private records and to lock your organizer.

To assign a password:

1. Tap the Applications icon .
2. Tap the Security icon.
3. Tap the Password box.
4. Enter a password.



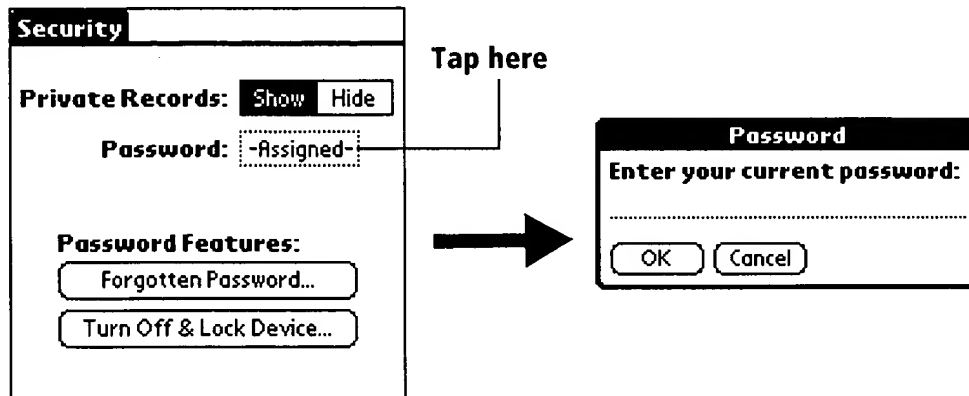
5. Tap OK.
6. Enter the *same* password a second time, and tap OK.

Changing or deleting a password

Once you define a password for your organizer, you can change or delete it at any time. You must enter the current password before you can change or delete it.

To change or delete your password:

1. Tap the Password box.
2. Enter the current password.



3. Tap OK.
4. Do one of the following:

To change the password, enter the new password, and tap OK.

To delete the password, tap Delete.



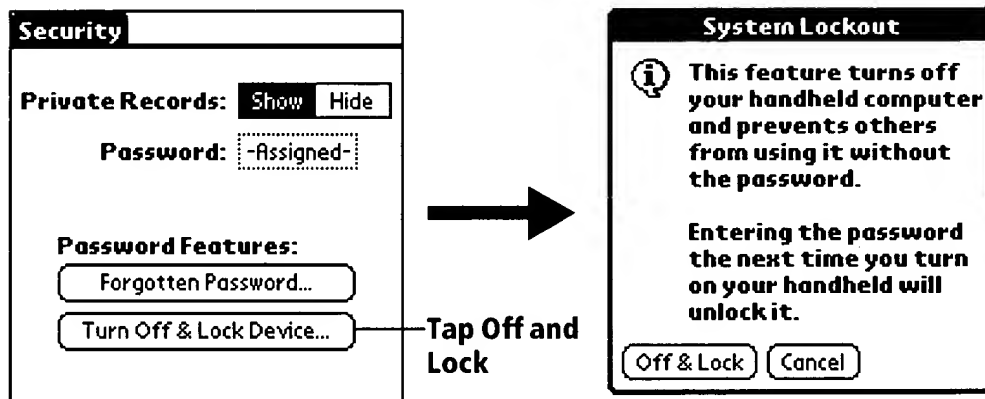
Locking your organizer

You can also lock your organizer so that you need to enter your password to operate it.

Important: If you lock your organizer, you must enter the exact password to re-activate your organizer. If you forget the password, you must perform a hard reset to resume using your organizer. Performing a hard reset deletes all the records in your organizer; however, you can restore all synchronized data at the next HotSync operation. See "Resetting your organizer" in Appendix A for more information.

To lock your organizer with a password:

1. Perform a HotSync operation to synchronize the data between your organizer and your computer. See “Exchanging and updating data: HotSync operations” in Chapter 4 for information on synchronizing your data.
2. Assign a password.
3. Tap Turn Off & Lock Device.



4. Tap Off & Lock.
5. To start your organizer, turn it on and then enter the password.

Recovering from a forgotten password

If you did not activate the Off & Lock feature and you forget your password, you can delete the password from your organizer. Deleting a forgotten password also deletes all entries and files marked as Private.

Important: If you synchronize with your computer before deleting a forgotten password, your organizer restores your private entries the next time you perform a HotSync operation, but it does not restore the password.

To delete a forgotten password:

1. Tap Forgotten Password.
2. Tap Yes.

Chapter 4

Using Your Basic Applications

Your Palm V™ organizer includes these basic applications:

- Date Book
- Address Book
- To Do List
- Memo Pad
- Calculator
- Expense

This chapter is divided into three sections:

- “Overview of basic applications” briefly describes each application and explains how to open it.
- “Common tasks” gives instructions on how to do tasks that you can do in most or all of the basic applications. It’s easy to transfer what you learn in one application to the others because the structure and behavior of all the applications are quite similar.
- “Application-specific tasks” is organized by application and gives instructions on how to do tasks that are specific to each application.

Overview of basic applications

Date Book



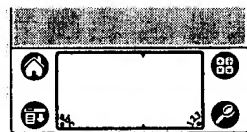
Date Book lets you quickly and easily schedule appointments or any kind of activity associated with a time and date.

In Date Book, you can do the following:

- Enter a description of your appointment and assign it to a specific time and date.
- Display a chart of your appointments for an entire week. The Week View makes it easy to spot available times and any potential scheduling overlaps or conflicts.
- Display a monthly calendar to quickly spot days where you have morning, lunch, or afternoon appointments.
- Set an alarm to sound prior to the scheduled activity.
- Create reminders for events that are based on a particular date, rather than time of day. Birthdays and anniversaries are easy to track with your organizer.
- Attach notes to individual events for a description or clarification of the entry in your Date Book.

To open Date Book:

- Press the Date Book application button on the front panel of your organizer. Date Book opens to today's schedule.



Date Book button

Note: Press the Date Book application button repeatedly to cycle through the Day, Week, and Month views.

Address Book



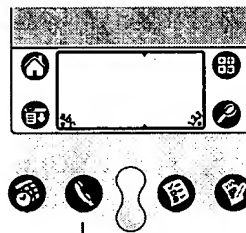
Address Book enables you to keep names, addresses, phone numbers, and other information about your personal or business contacts.

In Address Book, you can do the following:

- Quickly look up or enter names, addresses, phone numbers, and other information.
- Enter up to five phone numbers (home, work, fax, car, etc.) or e-mail addresses for each name.
- Define which phone number appears in the Address List for each Address Book entry.
- Attach a note to each Address Book entry, in which you can enter additional information about the entry.
- Assign Address Book entries to categories so that you can organize and view them in logical groups.

To open Address Book:

- Press the Address Book application button on the front panel of your organizer. Address Book opens to display the list of all your records.



Address Book button

Note: Press the Address Book application button repeatedly to cycle through the categories in which you have records.

To Do List



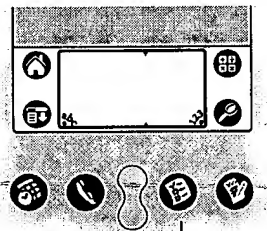
To Do List is a convenient place to create reminders and prioritize the things that you have to do.

In To Do List, you can do the following:

- Make a quick and convenient list of things to do.
- Assign a priority level to each task.
- Assign a due date for any or all of your To Do List items.
- Assign To Do List items to categories so that you can organize and view them in logical groups.
- Sort your To Do List items either by due date, priority level, or category.
- Attach notes to individual To Do List items for a description or clarification of the task.

To open To Do List:

- Press the To Do List application button on the front panel of your organizer. To Do List opens to display the category of items you last viewed.



To Do List button

Note: Press the To Do List application button repeatedly to cycle through the categories in which you have items.

Memo Pad



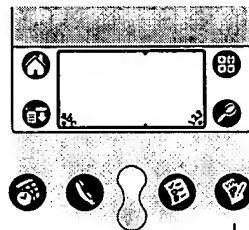
Memo Pad provides a place to take notes that are not associated with records in Date Book, Address Book, or To Do List.

In Memo Pad, you can do the following:

- Take notes or write any kind of message on your organizer.
- Drag and drop memos into popular computer applications like Microsoft Word when you synchronize using Palm™ Desktop software and HotSync® technology.
- Assign memos to categories so that you can organize and view them in logical groups.
- Write down phone numbers and other types of information. Later, you can copy and paste this information to other applications.

To open Memo Pad:

- Press the Memo Pad application button on the front panel of your organizer. Memo Pad opens to display the last Memo Pad screen that you viewed.



Memo Pad button

Note: Press the Memo Pad application button repeatedly to cycle through the categories in which you have memos.

Calculator



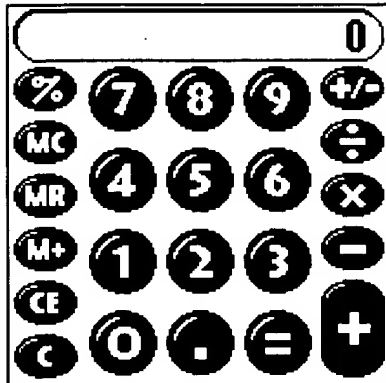
Calculator enables you to perform addition, subtraction, multiplication, and division.

In Calculator, you can do the following:

- Perform basic calculations.
- Store and retrieve values.
- Display the last series of calculations, which is useful for confirming a series of “chain” calculations.

To open Calculator:

- Tap the Calculator icon  next to the Graffiti® writing area.



Expense





Expense lets you keep track of your expenses and then transfer the information to a spreadsheet on your computer.

In Expense, you can do the following:

- Record dates, types of expenses, amount spent, payment method, and other details associated with any money that you spend.
- Assign expense items to categories so that you can organize and view them in logical groups.
- Keep track of vendors (companies) and people involved with each particular expense.
- Log miles traveled for a particular date or expense category.
- Sort your expenses by date or expense type.
- Transfer your expense information to a Microsoft Excel spreadsheet (version 5.0 or later) on your computer. (Microsoft Excel is *not* included in the Palm V organizer package.)

To open Expense:

1. Tap the Applications icon .
2. Tap the Expense icon .

Common tasks

The tasks described in this section use the term “records” to refer to an individual item in any of the basic applications: a single Date Book event, Address Book entry, To Do List item, Memo Pad memo, or Expense item.

Creating records

You can use the following procedure to create a new record in Date Book, Address Book, To Do List, Memo Pad, and Expense.

To create a record:

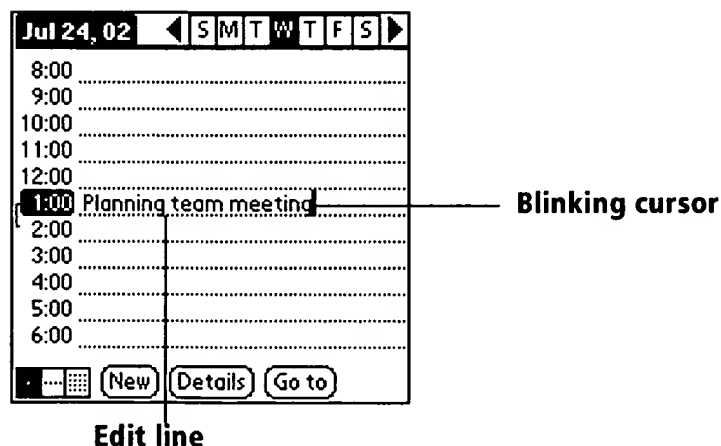
1. Select the application in which you want to create a record.
2. Tap New.
3. In Date Book only: Select start and end times for your appointment and tap OK.
4. Enter text for the record.
5. (Optional) Tap Details to select attributes for the record.
6. In Address Book and Memo Pad only: Tap Done.

There’s no need to save the record because your organizer saves it automatically.

Editing records

After you create a record, you can change, delete, or enter new text at any time. Two screen features tell you when your organizer is in editing mode:

- A blinking cursor
- One or more edit lines



Entering text

For information on how to enter text using Graffiti writing, the onscreen keyboard, or the keyboard attached to your computer, see Chapter 2.

Edit menu

The Edit menu is available with any screen where you enter or edit text. In general, commands available in the Edit menu apply to text that you *select* in an application.

To select text in an application:

1. Tap the beginning of the text that you want to select.
2. Drag the stylus over the text to highlight it (in black).

Note: You can drag *across* the text to select additional words, or drag *down* to select a group of lines.


The following commands may appear in an Edit menu:

Undo	Reverses the action of the <i>last edit</i> command. For example, if you used Cut to remove text, Undo restores the text you removed. Undo also reverses deletions done by using backspace.
Cut	Removes the selected text and stores it temporarily in the memory of your organizer. You can paste the text you cut into another area of the current application or into a different application.
Copy	Copies the selected text and stores it temporarily in the memory of your organizer. You can paste the text that you copy into another area of the current application or into a different application.
Paste	Inserts the text that you cut or copied at the selected point in a record. The text you paste replaces any selected text. If you did not previously cut or copy text, Paste does nothing.
Select All	Selects all of the text in the current record or screen. This enables you to cut or copy all of the text and paste it elsewhere.

Keyboard	Opens the onscreen keyboard. When you finish with the onscreen keyboard, tap Done.
Graffiti Help	Opens screens that show all the Graffiti character strokes. Use this command anytime you forget a stroke for a character.

Deleting records

To delete a record in any of the basic applications:

1. Select the record you want to delete.
2. Tap the Menu icon .
3. Tap Record, and then tap the Delete command:

Date Book: Delete Event

Address Book: Delete Address

To Do List: Delete Item

Memo Pad: Delete Memo

Expense: Delete Item

A confirmation dialog box appears. If you want to save a copy of the deleted item to an archive file in Palm Desktop software, be sure that the check box is checked. If you don't want to save a copy, tap the check box to remove the check.

4. Tap OK.

If you choose to save a copy of the selected item, your organizer transfers it to the archive file on your desktop the next time you perform a HotSync operation.

Other ways to delete records

You can also delete records in the following ways:

- In the Details dialog box of the application, tap Delete, and then tap OK.
- Delete the text of the record.

Note: In Date Book, if you delete the text of a repeating event, you delete all instances of that event.

Purging records


Over time, as you use Date Book, To Do List, and Expense, you'll accumulate records in these applications that have outlived their usefulness. For example, events that occurred months ago remain in the Date Book, and To Do List items that you marked as completed remain in the list, as do Expense items.

All these outdated records take up memory on your organizer, so it's a good idea to remove them by using Purge. If you think Date Book or To Do List records might prove useful later, you can purge them from your organizer and save them in an archive file.

Purging is also available in Mail. See Chapter 5 for more information.

Purging is not available in Address Book or Memo Pad, so delete outdated records from these applications.

To purge records:

1. Open the application.
2. Tap the Menu icon .
3. Tap Record, and then tap Purge.

A confirmation dialog box appears.

Date Book: Tap the pick list and select how old a record must be to be purged. Purge deletes repeating events if the last of the series ends before the date that you purge records.

Date Book, To Do List: If you want to save a copy of the purged records to an archive file on your desktop, be sure that the check box is checked. If you don't want to save a copy, tap the check box to remove the check box.

4. Tap OK.

If you chose to save a copy of the purged records, your organizer transfers them to an archive file on your desktop the next time you perform a HotSync operation.

Note: Purging does not happen automatically. You must tap the command to make it happen.

Exchanging and updating data: HotSync operations

The HotSync process automatically synchronizes — that is, exchanges and updates — data between your organizer and Palm Desktop software. Changes you make on your organizer or Palm Desktop

software appear in both places after a HotSync operation. HotSync technology synchronizes only the needed portions of files, thus reducing synchronization time.

You can synchronize your data by connecting your organizer directly to your computer with the cradle or indirectly with a Palm V™ Modem or network. You can also perform HotSync operations using the IR port on your organizer. See Chapter 6 for information about performing HotSync operations via a modem, network, or IR port.

Performing a HotSync operation for the first time

The first time you synchronize your data, you need to enter user information on both the organizer and Palm Desktop software. After you enter this information and synchronize, the HotSync Manager recognizes your organizer and doesn't ask for this information again.

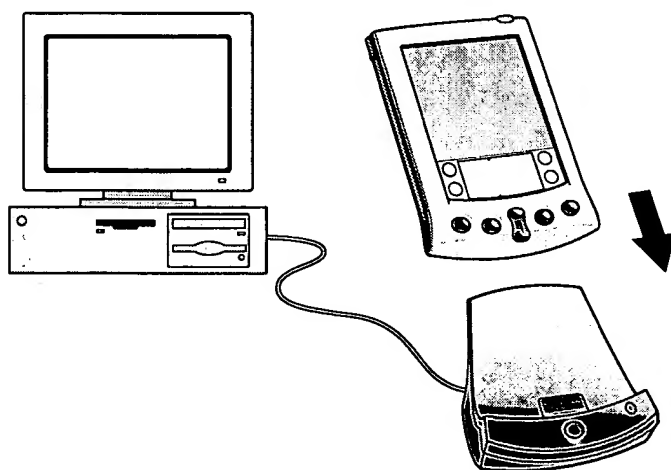
If you are a System Administrator preparing several connected organizers for a group of users, you may want to create a user profile. See "Creating a user profile" in Chapter 6 before performing the following steps.

Important: You must perform your *first* HotSync operation with a local, direct connection, rather than using a modem.


The following steps assume that you have already installed the Palm Desktop software. If you have not installed this software, see "Installing Palm Desktop software" in Chapter 1 for instructions.

To perform a local HotSync operation:

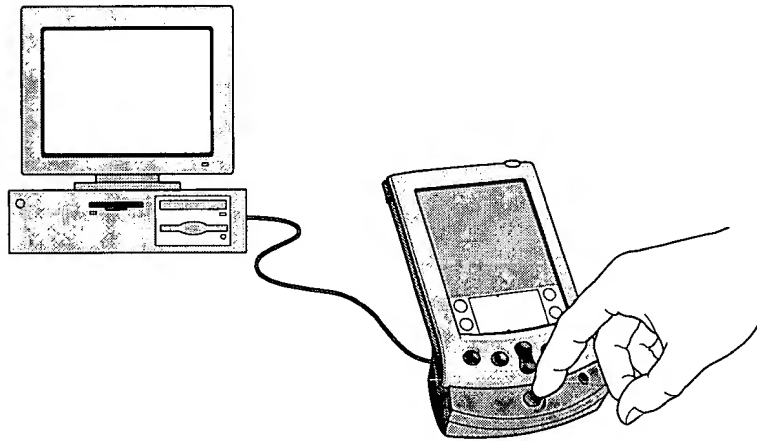
1. Insert your organizer into the cradle.



Tip: The bottom edge of the organizer should align smoothly with the cradle when it is inserted properly.

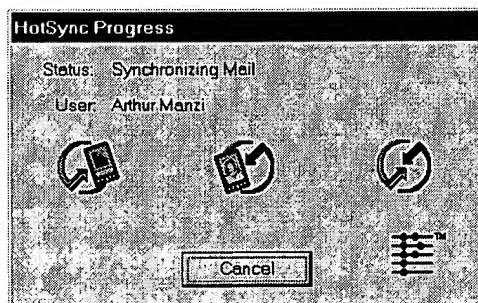
2. If the HotSync Manager is not running, start it: On the Windows desktop, click Start, and then choose Programs. Navigate to the Palm Desktop software program group and choose HotSync Manager. Alternatively, you can start the Palm Desktop software which automatically opens the HotSync Manager.
3. Press the HotSync button ™ on the cradle.

Note: If you are using an optional HotSync cable instead of a cradle, click the HotSync Manager icon in the Windows system tray and select Local from the menu.



Important: The first time you perform a HotSync operation, you must enter a user name in the New User dialog box and click OK. Every organizer should have a unique name. To prevent loss of a user's records, never try to synchronize more than one organizer to the same user name.

The HotSync Progress dialog box appears and synchronization begins.



4. Wait for a message on your organizer indicating that the process is complete.

After the HotSync process is complete, you can remove your organizer from the cradle.

Categorizing records

Categorize records in the Address Book, To Do List, Memo Pad, and Expense applications so that they are grouped logically and are easy to review. (You can also categorize applications. See “Using the Applications Launcher” in Chapter 3 for more information.)

When you create a record, your organizer automatically places it in the category that is currently displayed. If the category is All, your organizer assigns it to the Unfiled category. You can leave an entry as Unfiled or assign it to a category at any time.

System-defined and user-defined categories

By default, your organizer includes system-defined categories, such as All and Unfiled, and user-defined categories, such as Business and Personal.

You cannot modify the system-defined categories, but you can rename and delete the user-defined categories. In addition, you can create your own user-defined categories. You can have a maximum of 15 user-defined categories in each application.

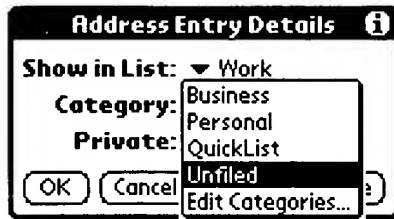
Address Book contains the QuickList user-defined category, in which you can store the names, addresses, and phone numbers you might need in emergencies (doctor, fire department, lawyer, etc.).

Expense contains two user-defined categories, New York and Paris, to show how you might sort your expenses according to different business trips.

Note: The illustrations in this section come from Address Book, but you can use these procedures in all the applications in which categories are available. Categories are not available in Date Book.

To move a record into a category:

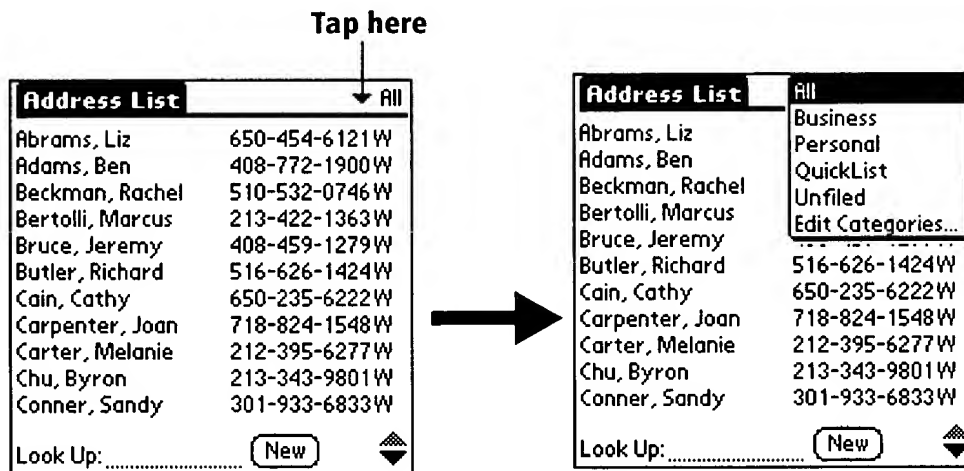
1. Select the record you want to categorize.
2. In Address Book only: Tap Edit.
3. Tap Details.
4. Tap the Category pick list to display the list of available categories.



5. Select the category for the record.
6. Tap OK.

To display a category of records:

1. Tap the category pick list in the upper-right corner of the List screen.



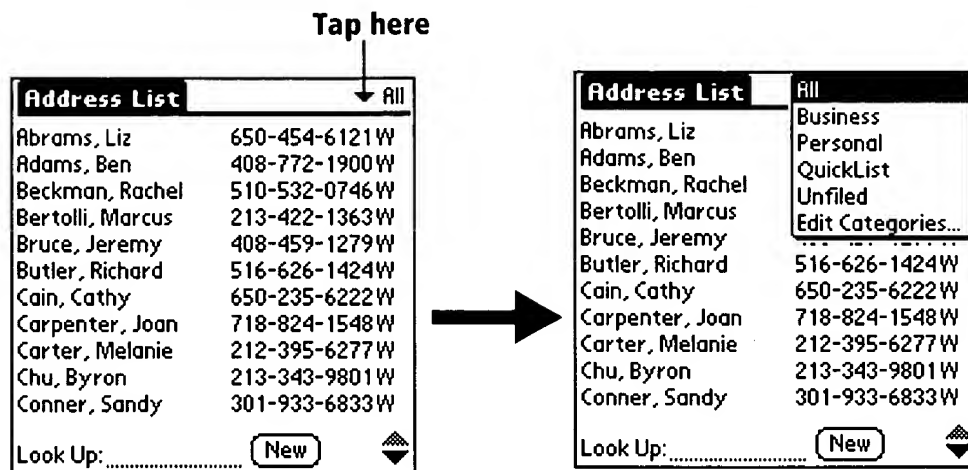
2. Select the category you want to view.

The List screen now displays only the records assigned to that category:

Tip: Pressing an application button on the front panel of the organizer toggles through all the categories of that application.

To define a new category:

1. Tap the category pick list in the upper-right corner of the screen.



2. Tap Edit Categories.
3. Tap New.



4. Enter the name of the new category, and then tap OK.

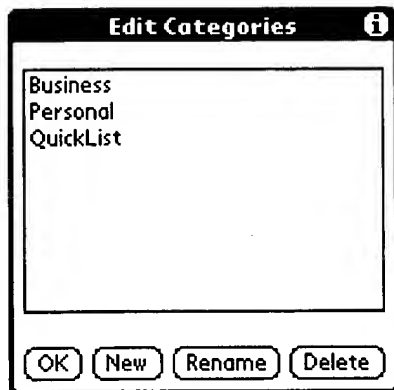


5. Tap OK.

You can assign any of your records to the new category.

To rename a category:

1. Tap the category pick list in the upper-right corner of the screen.
2. Tap Edit Categories.
3. Select the category that you want to rename, and then tap Rename.



4. Enter the new name for the category, and then tap OK.



5. Tap OK.

Tip: You can group the records in two or more categories into one category by giving the categories the same name. For example, if you change the name of the Personal category to Business, all records formerly in the Personal category appear in the Business category.

Finding records

Your organizer offers several ways to find information quickly:

- **All applications:** Find locates any text that you specify, always starting with the current application.
- **Date Book, To Do List, Memo Pad:** Phone Lookup displays the Address List screen and lets you add the information that appears in this list to a record.
- **Address Book:** The Look Up line lets you enter the first letters of a name to scroll immediately to that name.
- **Expense:** Lookup displays the names in your Address Book that have data in the Company field. You can add these names to a list of attendees associated with an Expense record.

Looking up Address Book records

When working with Address Book, the scroll button on the front panel of the organizer makes it easy to navigate among your address entries.

- In the Address List screen, the scroll button moves up or down an entire screen of records. If you hold down the scroll button, you accelerate the scrolling and display every third screen.
- In the Address View screen, the scroll button moves to the previous or next address record.

You can also use the Address List Look Up feature to quickly scroll to any of your Address Book entries.

To look up an Address Book record:

1. Display the Address List screen.
2. Enter the first letter of the name you want to find.

Address List		▼ All
Abrams, Liz	650-454-6121 W	
Adams, Ben	408-772-1900 W	
Beckman, Rachel	510-532-0746 W	
Bertolli, Marcus	213-422-1363 W	
Bruce, Jeremy	408-459-1279 W	
Butler, Richard	516-626-1424 W	
Cain, Cathy	650-235-6222 W	
Carpenter, Joan	718-824-1548 W	
Carter, Melanie	212-395-6277 W	
Chu, Byron	213-343-9801 W	
Conner, Sandy	301-933-6833 W	

Look Up: car New [Scroll Button]

Look Up line

The list scrolls to the first entry that begins with that letter. If you write another letter, the list scrolls to the first entry that starts with those *two* letters. For example, writing an "s" scrolls to "Sands," and writing "sm" scrolls further to "Smith." If you sort the list by company name, the Look Up feature scrolls to the first letter of the company name.

3. Tap the record to view its contents.

Using Find

You can use Find to locate any text that you specify, in any application.

To use Find:

1. Tap the Find icon .

Tip: If you select text in an application before you tap Find, the selected text automatically appears in the Find dialog box.

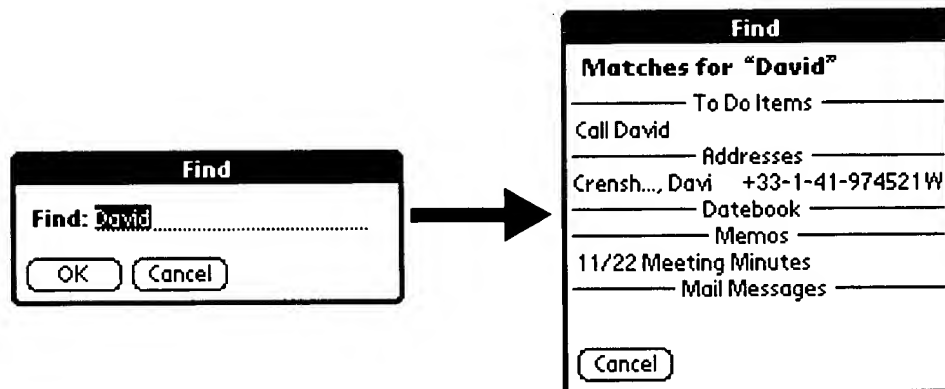
2. Enter the text that you want to find.

Find is *not* case-sensitive. For example, searching for the name "davidson" also finds "Davidson."

Find locates any words that begin with the text you enter. For example, searching for "plane" finds "planet," but not "air-plane."

3. Tap OK.

Find searches for the text in all records and all notes.




As your organizer searches for the text, you can tap Stop at any time. You may want to do this if the entry you want appears before your organizer finishes the search. To continue the search after you tap Stop, tap Find More.

4. Tap the text that you want to review.

Using Phone Lookup


Phone Lookup displays the Address List screen and lets you add the information that appears in this list to a record.

To use Phone Lookup:

1. Display the record in which you want to insert a phone number.
The record can be in Date Book, To Do List, or Memo Pad.
2. Tap the Menu icon .
3. Tap Options, and then tap Phone Lookup.
4. Begin to spell the last name of the name you want to find.

The list scrolls to the first record in the list that starts with the first letter you enter. Continue to spell the name you're looking for, or when you see the name, tap it.

Phone Number Lookup:	
Abrams, Liz	650-454-6121 W
Adams, Ben	408-772-1900 W
Beckman, Rachel	510-532-0746 W
Bertolli, Marcus	213-422-1363 W
Bruce, Jeremy	408-459-1279 W
Butler, Richard	516-626-1424 W
Cain, Cathy	650-235-6222 W
Carpenter, Joan	718-824-1548 W
Carter, Melanie	212-395-6277 W
Chu, Byron	213-343-9801 W
Conner, Sandy	301-933-6833 W

Look Up: car..... 

5. Tap Add.

The name you selected, along with the other information associated with it, is pasted into the record you selected in step 1.

Phone Lookup tips

Write the Graffiti Command stroke “/L” to activate the Phone Lookup feature. You can also activate it in the following circumstances:

- **While entering text:** For example, to insert the full name and phone number for someone with the last name “Williams,” write the Graffiti characters for “Wi” and then the Phone Lookup Command stroke “/L.”

Assuming you have only one Address Book record that begins with “Wi,” your organizer inserts the full name “Fred Williams” (and its associated information). If you have more than one name that begins with “Wi,” the Phone Lookup screen appears and highlights the first record that begins with “Wi.”

- **For selected text:** Drag to highlight the text, and then write the Phone Lookup Command stroke “/L.” Your organizer replaces the selected text and adds the name and its associated information.

Looking up names to add to expense records

In Expense, Lookup displays the names in your Address Book that have data in the Company field. You can add these names to a list of attendees associated with an Expense record.

To add names to an Expense record:

1. Tap the Expense record to which you want to add names.
2. Tap Details.

Receipt Details

Category: ▼ Unfiled

Type: ▼ Lunch

Payment: ▼ Unfiled

Currency: ▼ \$

Vendor:

City:

Attendees: Who...

OK Cancel Delete Note ↑

- ### 3. Tap Who.

The diagram illustrates the data flow between two screens. On the left, the 'Receipt Details' screen has a 'Category' dropdown (set to 'Unfiled'), a 'Type' dropdown (set to 'Lunch'), a 'Payment' dropdown (set to 'MasterCard'), a 'Currency' dropdown (set to '\$'), a 'Vendor' text field (containing 'Rosie's Cafe'), a 'City' text field (containing 'San Francisco'), and an 'Attendees' text field (containing 'Who...'). Below these fields are four buttons: 'OK', 'Cancel', 'Delete', and 'Note', followed by an upward arrow. On the right, the 'Attendees' screen shows a list of attendees with dotted lines for each entry. At the bottom are 'Done' and 'Lookup' buttons, and a status bar with 'A A' and a right arrow. A large black arrow points from the 'Attendees' field in the 'Receipt Details' screen to the 'Attendees' list in the 'Attendees' screen. A line connects the 'Attendees' field in the 'Receipt Details' screen to the text 'Tap here'.

- #### 4. Tap Lookup.

The Attendees Lookup screen displays all the names in your Address Book that have data in the Company field.

5. Select the name you want to add, and then tap Add.

The name appears in the Attendees screen.

6. Repeat steps 4 and 5 to add more names.
7. Tap Done.
8. Tap OK.

Sorting lists of records


You can sort lists of records in various ways, depending on the application. Sorting is available in applications that have List screens: Address Book, To Do List, Memo Pad, and Expense.

Note: You can also assign records to categories. See “Categorizing records” earlier in this chapter.

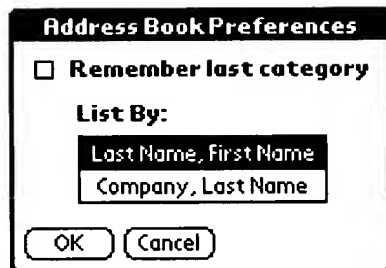
To sort records in To Do List and Expense:

1. Open the application to display the List screen.
2. Tap Show.
3. Tap the Sort by pick list and select an option.
4. Tap OK.

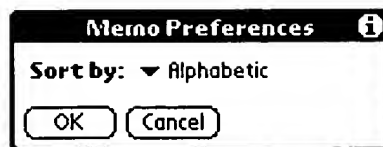
To sort records in Address Book and Memo Pad:

1. Open the application to display the List screen.
2. Tap the Menu icon .
3. Tap Options, and then tap Preferences.

Address Book:



Memo Pad:



4. Do one of the following:

Address Book: Tap the setting you want.

Memo Pad: Tap the Sort by pick list and select Alphabetic or Manual.

5. Tap OK.

To sort the Memo List manually, tap and drag a memo to a new location in the list.

Note: To make the list of your memos appear in Palm Desktop software as you manually sorted it on your organizer, open Memo Pad in Palm Desktop software and click List by. Then select Order on handheld.


Making records private

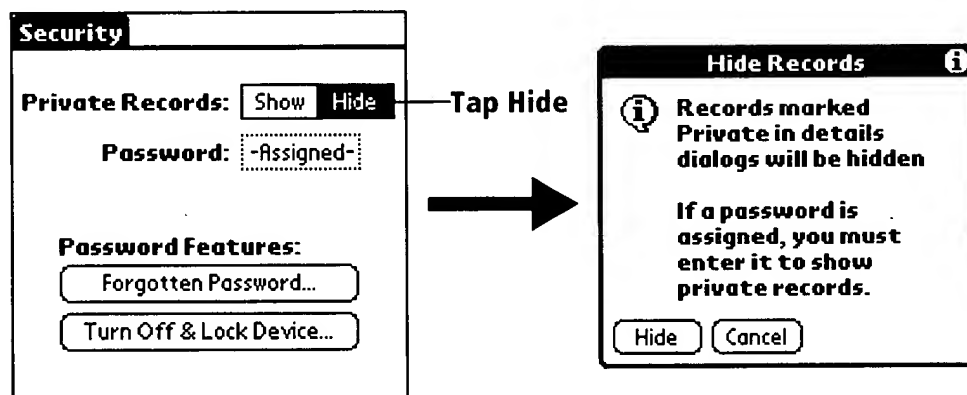
In all basic applications except Expense, you can make individual records private. Private records remain visible and accessible, however, until you select the Security setting to hide all private records. See "Security" in Chapter 3 for more information.

Hiding private records

You can hide records that you mark as private. If you define a password for your organizer, you must enter it to display private records.


To hide private records:

1. Tap the Applications icon .
2. Tap Security.
3. Tap Hide.



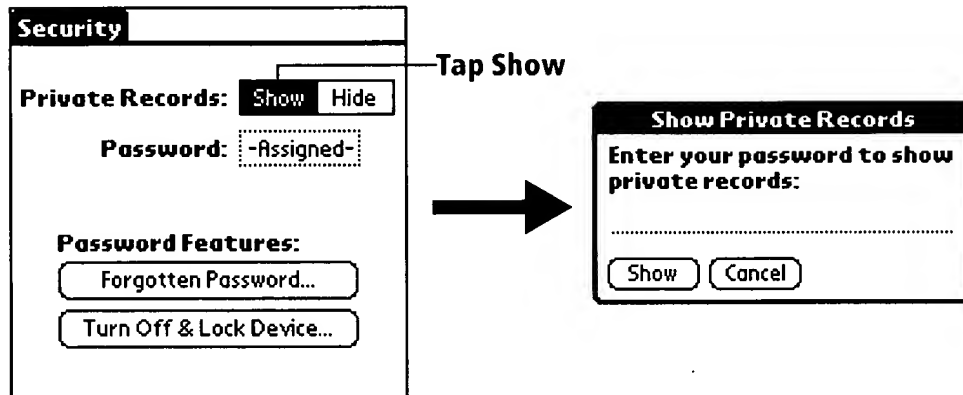
4. Tap Hide to confirm that you want to hide private records.

To display private records:

1. Tap the Applications icon .
2. Tap Security.
3. Tap Show.

If you do not have a password, hidden records become visible.

If you have a password, the Show Private Records dialog box appears. Go to step 4.



4. Enter your password, and then tap Show.

To make a record private:

1. Display the entry that you want to make private.
2. Tap Details.
3. Tap the Private check box to select it.
4. Tap OK.

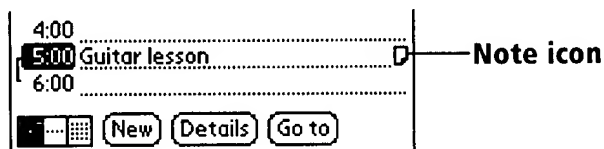
Attaching notes

In all basic applications except Memo Pad, you can attach a note to a record. A note can be up to several thousand characters long. For example, for an appointment in Date Book, you can attach a note with directions to the location.

To attach a note to a record:

1. Display the entry to which you want to add a note.
2. In Address Book only: Tap Edit.
3. Tap Details.
4. Tap Note.
5. Enter your note.
6. Tap Done.


A small note icon appears at the right side of any item that has a note.



To review or edit a note:

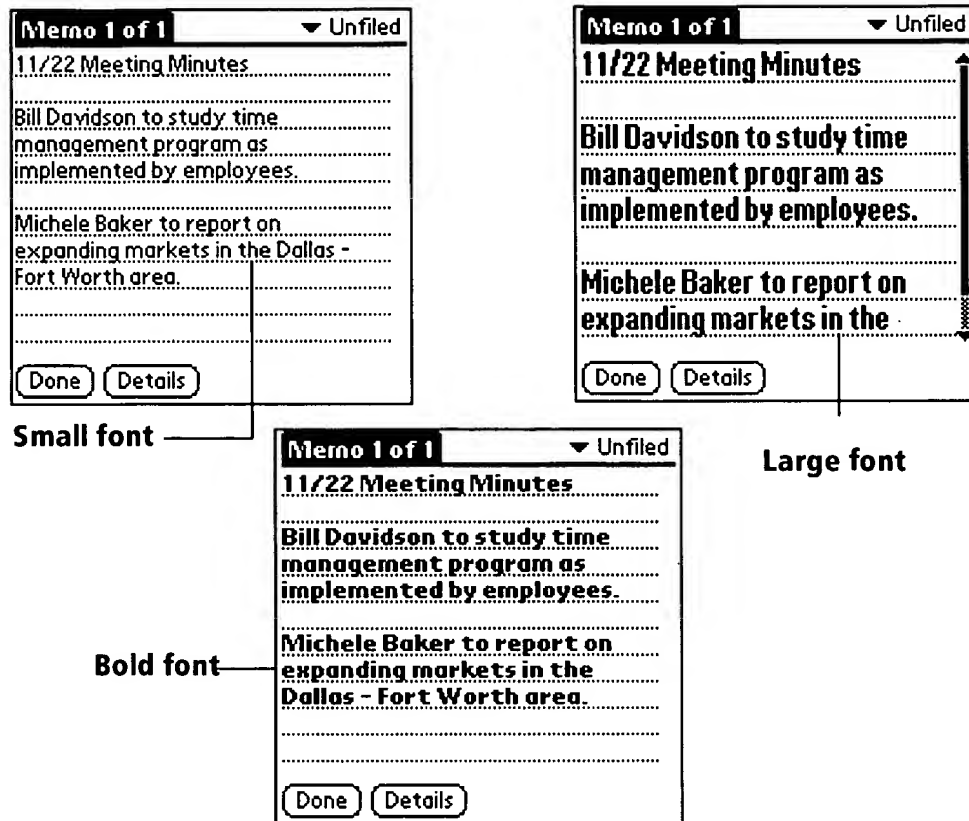
1. Tap the Note icon .

To delete a note:


1. Tap the Note icon .
2. Tap Delete.
3. Tap Yes.

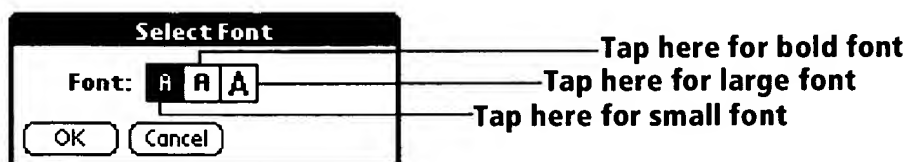
Choosing fonts

In all basic applications except Expense, you can change the font style to make text easier to read. You can choose a different font style for each application.



To change the font style:

1. Open an application.
2. Tap the Menu icon .
3. Tap Options, and then tap Font.
4. Tap the font style you want to use.



5. Tap OK.

Application-specific tasks

Date Book

When you open Date Book, the screen shows the current date and a list of times for a normal business day.

Scheduling an event

A record in Date Book is called an “event.” An event can be any kind of activity that you associate with a day. You can enter a new event on any of the available time lines.

When you schedule an event, its description appears on the time line, and its duration is automatically set to one hour. You can easily change the start time and duration for any event.

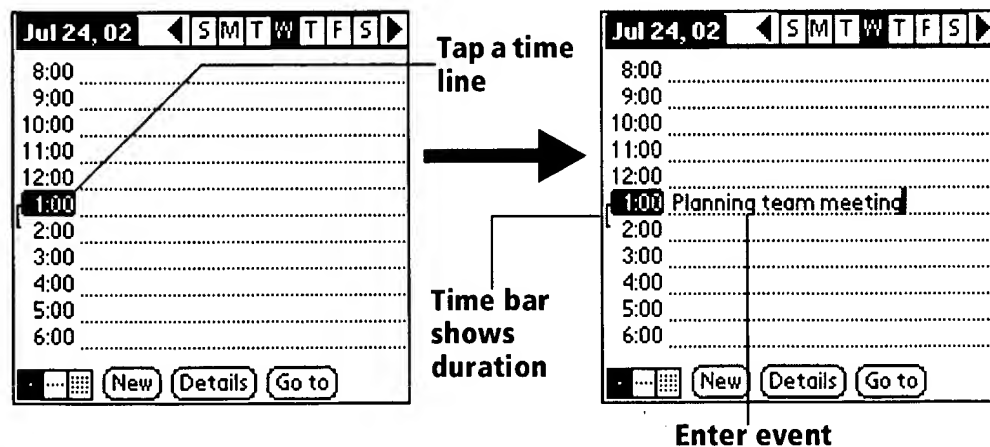
Note: It’s possible to schedule events that overlap, but Date Book makes it easy to find such conflicts. See “Spotting event conflicts” later in this chapter.

You can also schedule events in your Date Book that occur on a particular date but have no specific start or end times, such as birthdays, holidays, and anniversaries. These are referred to as “untimed events.” Untimed events appear at the top of the list of times, marked with a diamond. You can have more than one untimed event on a particular date.

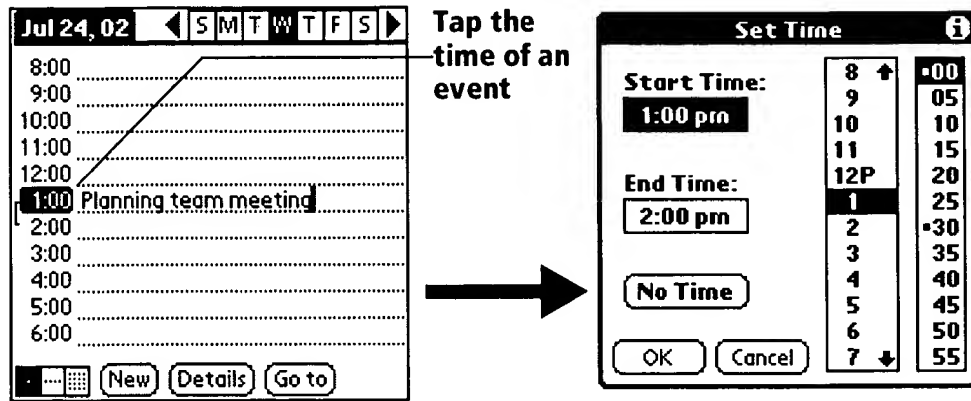
You can also schedule a repeating event, such as a weekly meeting, and continuous events, such as a three-day conference or a vacation.

To schedule an event for the current day:

1. Tap the time line that corresponds to the beginning of the event.

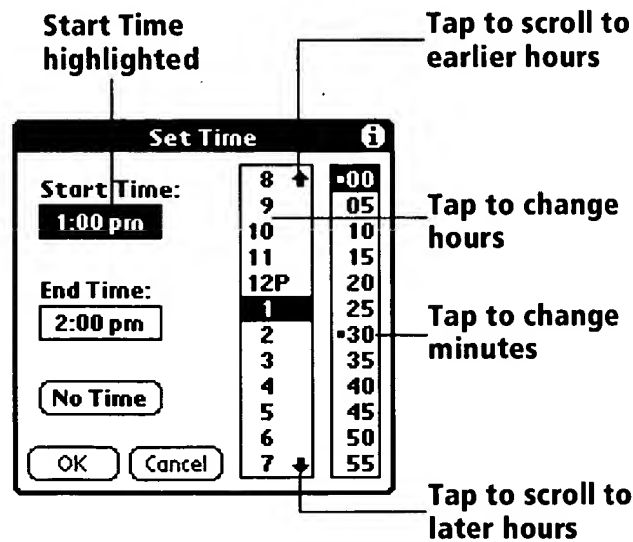


2. Enter a description of the event. You can enter up to 255 characters.
3. If the event is one hour long, skip to step 7. If the event is longer or shorter than an hour, tap the time of the event to open the Set Time dialog box.



Tip: You can also open the Set Time dialog (to select a start time) by making sure no event is selected, and then writing a number on the number side of the Graffiti writing area.

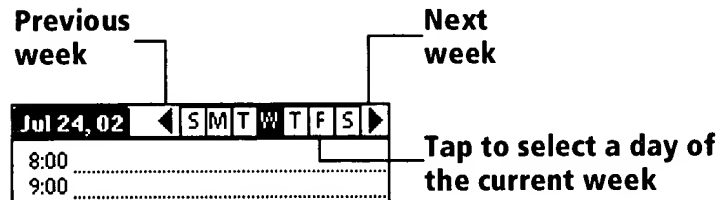
4. Tap the time columns on the right side of the Set Time dialog to set the Start Time.



5. Tap the End Time box, and then tap the time columns to set the End Time.
6. Tap OK.
7. Tap a blank area of the screen to deselect the event. A vertical line appears next to the time, indicating the duration of the event.

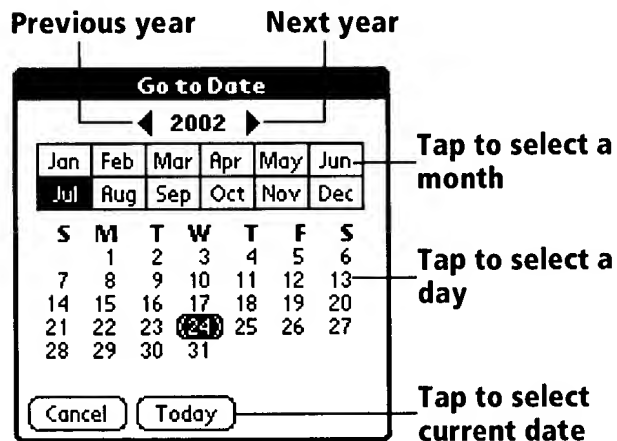
To schedule an event for another day:

1. Select the date you want for the event by doing one of the following:
 - Tap the day of the week that you want in the date bar at the top of the screen. If necessary, tap the Previous week or Next week scroll arrows to move to another week.



Tip: You can also use the scroll button on the front panel of your organizer to move forward or backward one day at a time.

- Tap Go To at the bottom of the screen to open the Go to Date dialog box. Select a date by tapping a year, month, and day in the calendar.

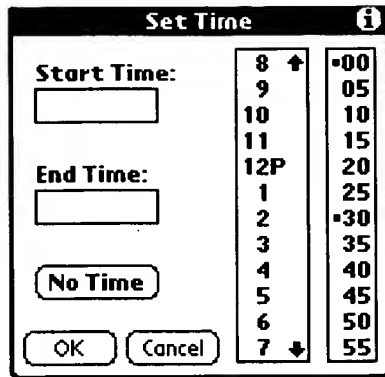


Tip: In the Go to Date dialog box, you can also use the scroll button on the front panel of the organizer to move forward or backward one month at a time.

2. After you locate the date, follow the steps for scheduling an event for the current day.

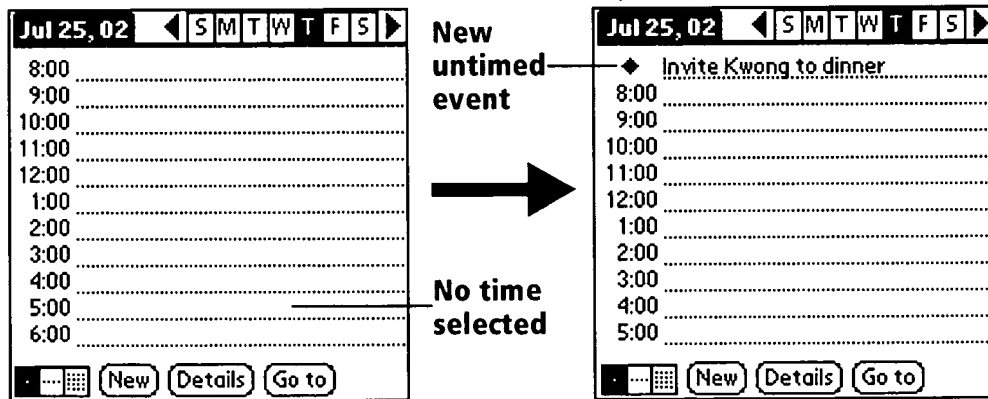
To schedule an untimed event:

1. Select the date that you want for the event as described in "To schedule an event for another day."
2. Tap New.
3. Tap OK, so that no start or end times are defined for the new event.



Tip: You can also create a new untimed event by making sure no event is selected and then writing letters in the Graffiti writing area.

4. Enter a description of the event.



5. Tap a blank area on the screen to deselect the untimed event.

Note: If you create an event and decide later that there is no particular start or end time, you can easily change it to an untimed event. Tap the time of the event in the Date Book screen, tap No Time, and then tap OK.

Rescheduling an event


You can easily make changes to your schedule with your organizer.

To reschedule an event:

1. Tap the event you want to reschedule.
2. Tap Details.
3. To change the time, tap the Time box and select a new time.
4. To change the date, tap the Date box and select a new date.
5. Tap OK.

Setting an alarm for an event

The Alarm setting enables you to set an audible alarm for events in your Date Book. You can set an alarm to sound minutes, hours, or days before an event. The default Alarm setting is 5 minutes before the time of the event, but you can change this to any number of minutes, hours, or days.

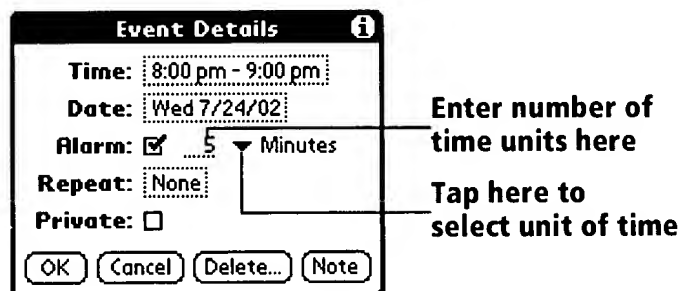
When you set an alarm, this icon  appears to the far right of the event with the alarm. When the alarm tone sounds, a reminder message also appears onscreen.

To set an alarm for an event:

1. Tap the event to which you want to assign an alarm.
2. Tap Details.
3. Tap the Alarm check box to select it.

The default setting, 5 Minutes, appears.

4. Tap the pick list to select Minutes, Hours, or Days.
5. Select the 5 and enter any number from 0 to 99 (inclusive) as the number of time units.



6. Tap OK.

Alarm for untimed events: You can set a silent alarm for an untimed event. In this case, the alarm triggers at the specified period of minutes, hours, or days before midnight (beginning) of the day of the untimed event. No audible alarm sounds for an untimed event; instead, the reminder message appears onscreen.

For example, you set an alarm for an untimed event that occurs on February 4th. If the alarm is set for 5 minutes, the reminder message appears at 11:55 PM on the night of February 3rd. The reminder remains onscreen until you turn on your organizer and tap OK to dismiss it.

Scheduling repeating or continuous events

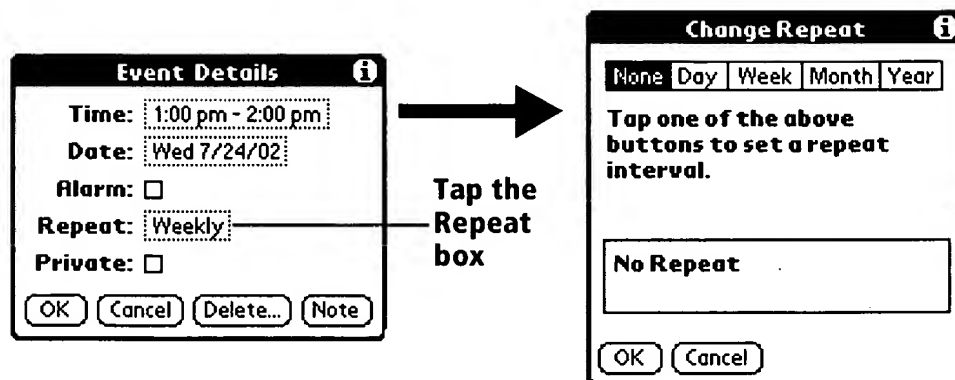
The Repeat function lets you schedule events that recur at regular intervals or extend over a period of consecutive days.

A birthday is a good example of an event that repeats annually. Another example is a weekly guitar lesson that falls on the same day of the week and the same time of day.

A business trip or a vacation is an example of a continuous event.

To schedule a repeating or continuous event:

1. Tap the event.
 - Typically, a continuous event is an untimed event.
2. Tap Details.
3. Tap the Repeat box to open the Change Repeat dialog box.




4. Tap Day, Week, Month, or Year to set how often event repeats.
 - For a continuous event, tap Day.


5. Enter a number that corresponds to how often you want the event to repeat on the Every line.

For example, if you select Month and enter the number 2, the event repeats every other month.

6. To specify an end date for the repeating or continuous event, tap the End on pick list and tap Choose Date. Use the date picker to select an end date.
7. Tap OK.

After you schedule a repeating or continuous event, this icon  appears to the far right of the event.

Considerations for repeating or continuous events: Keep the following points in mind.

- If you change the start date of a repeating event, your organizer calculates the number of days you moved the event. Your organizer then automatically changes the end date to maintain the duration of the repeating event.
- If you change the repeat interval (e.g., daily to weekly) of a repeating event, past occurrences (prior to the day on which you change the setting) are not changed, and your organizer creates a new repeating event.
- If you change the date of an occurrence of a repeating event (e.g., from January 14th to January 15th) and apply the change to all occurrences, the new date becomes the start date of the repeating event. Your organizer adjusts the end date to maintain the duration of the event.
- If you change other repeat settings (e.g., time, alarm, private) of a repeating event and apply the change to all occurrences, your organizer creates a new event. The start date of this new event is the day on which the setting is changed. Past occurrences (prior to the day of the change) are not changed.
- If you apply a change to a single occurrence of a repeating event (e.g., time), that occurrence no longer shows the Repeat icon .

Changing the Date Book view

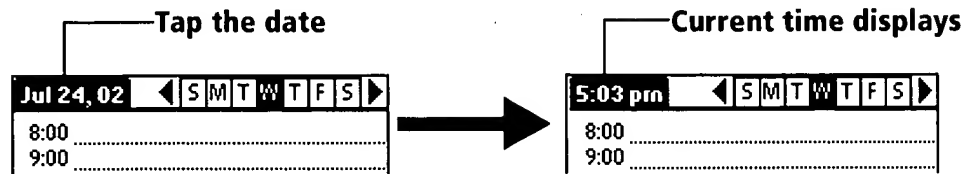
In addition to displaying the time list for a specific day, you can also display a whole week or month. You can also display the current time.

To cycle through Day, Week, and Month views:

- Press the Date Book application button repeatedly to display the next view.

To display the current time:

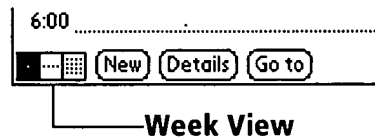
- Tap the date in the date bar to display the current time. After a few seconds, the date reappears.



Working in Week View: Week View shows the calendar of your events for an entire week. This view lets you quickly review your appointments and available time slots. In addition, the graphical display helps you spot overlaps and conflicts in your schedule.

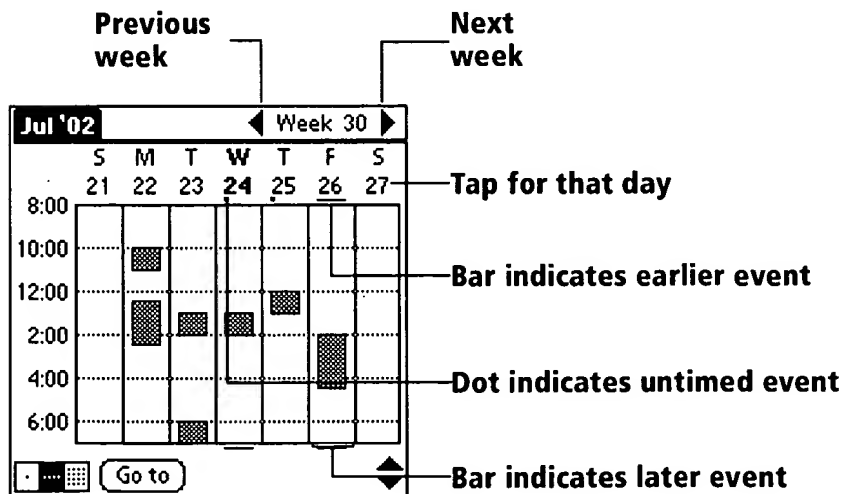
To display the Week View:

1. Tap the Week View button.

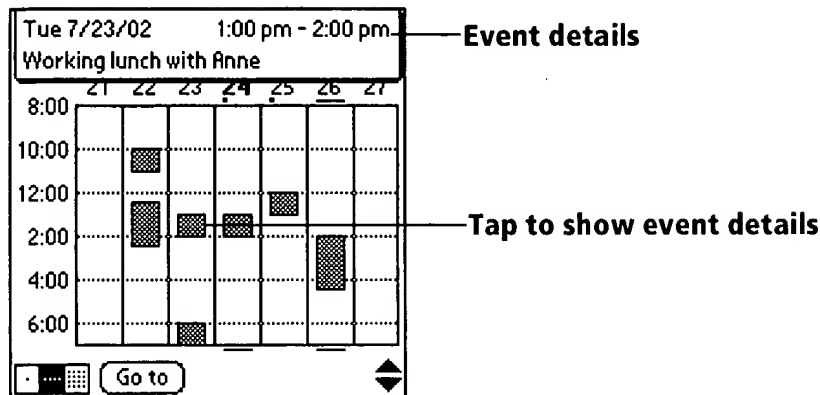


2. Tap the navigation controls to move forward or backward a week at a time, or to display details of an event.


Note: The Week View also shows untimed events and events that are before and after the range of times shown.



3. Tap an event to show a description of the event.



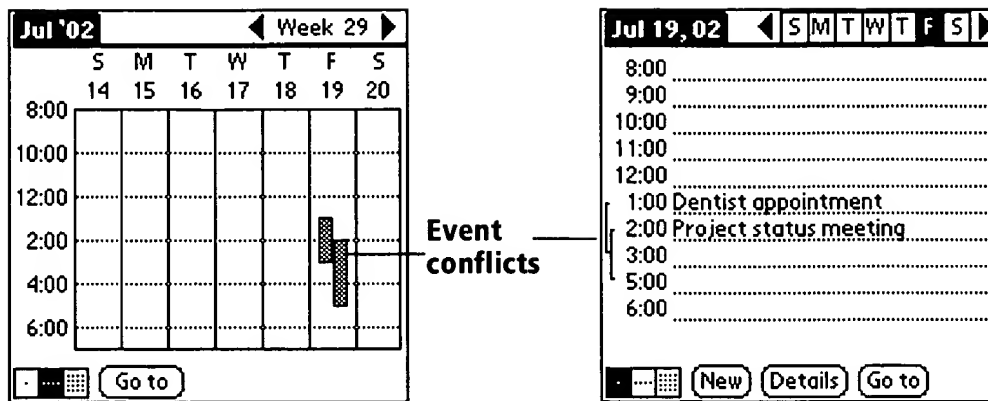
Tips for using Week View: Keep the following points in mind.

- To reschedule an event, tap and drag the event to a different time or day.
- Tap a blank time on any day to move to that day and have the time selected for a new event.
- Tap any day or date that appears at the top of the Week View to move directly to that day without selecting an event.
- The Week View shows the time span defined by the Start Time and End Time in the Date Book Preferences settings. If you have an event before or after this time span, a bar appears at the top or bottom of that day's column. Use the onscreen scroll arrows  to scroll to the event.

Spotting event conflicts

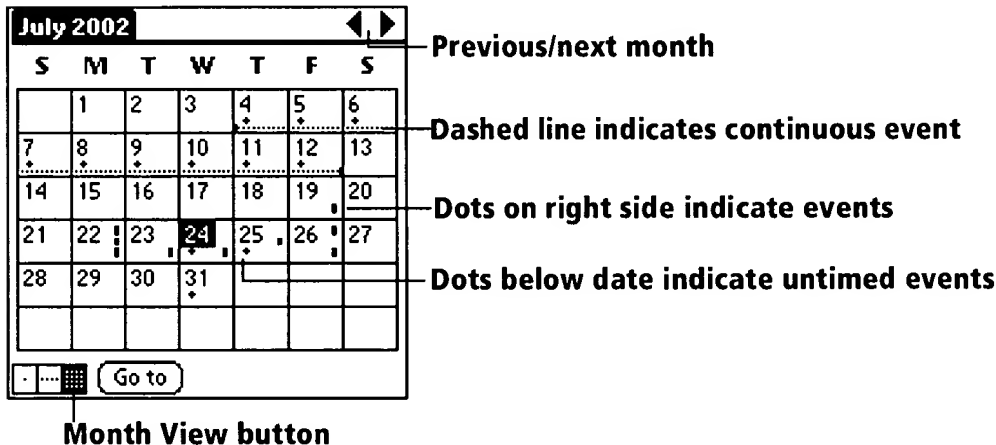
With the ability to define specific start and end times for any event, it's possible to schedule events that overlap (an event that starts before a previous event finishes).

An event conflict (time overlap) appears in the Week View as overlapping bars. The Day View displays overlapping brackets to the left of the conflicting times.



Working in Month View

The Month View screen shows which days have events scheduled. Dots and lines in the Month View indicate events, repeating events, and untimed events.



You can control the dots and lines that appear in the Month View. See "Options menu" later in this chapter.

Tips for using Month View: Keep the following points in mind.

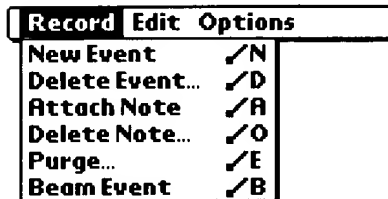
- Tap a day in the Month View to display that day in the Day View.
- Tap the scroll arrows in the upper-right corner to move forward or backward a month.
- Tap Go to to open the date selector and select a different month.
- Use the scroll button on the front panel of your organizer to move between months. Press the upper half of the button to display the previous month, the lower half to display the next month.

Date Book menus, preferences, and display options

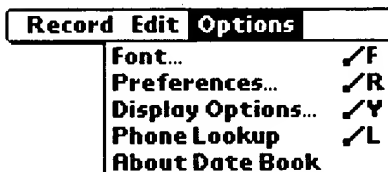
Date Book menus are shown here for your reference, and Date Book features that are not explained elsewhere in this book are described here.

See “Using menus” in Chapter 1 for information about choosing menu commands.

Record menu



Options menu



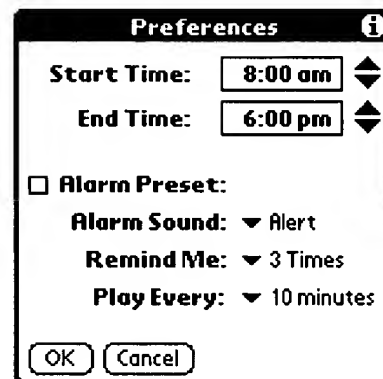
Display Options Allows you to change Date Book’s appearance and which events display.



- **Show Time Bars.** Activates the time bars that appear in the Day View. The time bars show the duration of an event and illustrate event conflicts.

- **Compress Day View.** Controls how times appear in the Day View. When Compress Day View is off, all time slots display. When it is on, start and end times display for each event, but blank time slots toward the bottom of the screen disappear to minimize scrolling.
- **Month View settings.** These check boxes apply to the Month View of the Date Book. You can activate any or all of these settings to show that you have Timed, Untimed, or Daily Repeating events in the Month View *only*.

Preferences



- **Start/End Time.** Defines the start and end times for Date Book screens. If the time slots you select do not fit on one screen, you can tap the scroll arrows to scroll up and down.
- **Alarm Preset.** Automatically sets an alarm for each new event. The silent alarm for untimed events is defined by minutes, days, or hours before midnight of the date of the event.
- **Alarm Sound.** Sets the tone of the alarm.
- **Remind Me.** Defines how many times the alarm sounds. The choices are Once, Twice, 3 Times, 5 Times, and 10 Times.
- **Play Every.** Defines how often the alarm sounds. The choices are Minute, 5 minutes, 10 minutes, and 30 minutes.

About Date Book

Shows version information for Date Book.

Address Book

Address Book is the application in which you store name and address information about people or businesses.


Creating an Address Book entry

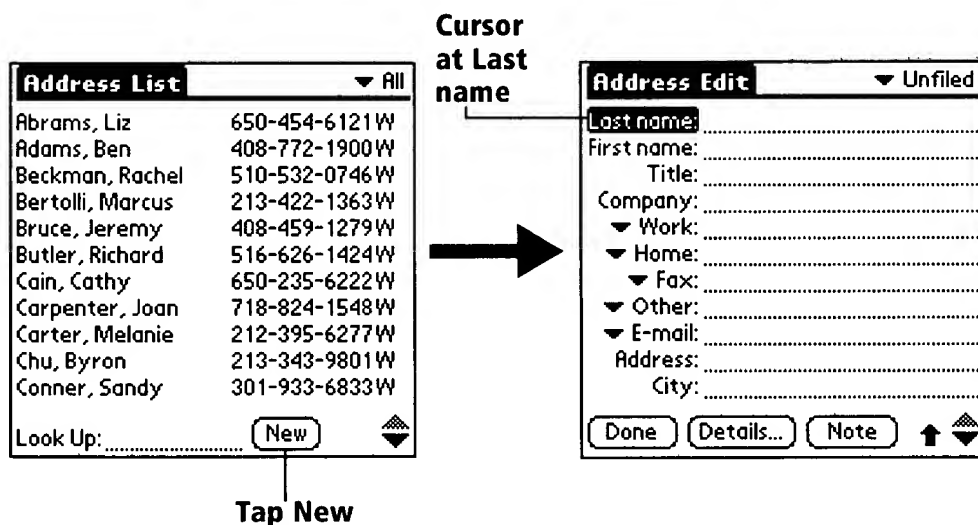
A record in Address Book is called an “entry.” You can create entries on your organizer, or you can use Palm Desktop software to create entries on your computer and then download the entries to your organizer with your next HotSync operation.

Palm Desktop software also has data import capabilities that enable you to load database files into Address Book on your organizer.

See “Importing data” in Chapter 2 and Palm Desktop online Help for more information.

To create a new Address Book entry:

1. Press the Address Book application button  on the front of your organizer to display the Address List.
2. Tap New.




3. Enter the last name of the person you want to add to your Address Book.

Note: The organizer automatically capitalizes the first letter of each field (except numeric and e-mail fields). You do not have to use the Graffiti capital stroke to capitalize the first letter of the name.

4. Use the Next Field Graffiti stroke to move to the First Name field.



Tip: You can also move to any field by tapping it directly.

5. Enter the person's first name in the First Name field.
6. Enter the other information that you want to include in this entry.
7. Tap the scroll arrows  to move to the next page of information.
8. After you finish entering information, tap Done.

A screenshot of the "Address Edit" form. The form has a title bar with "Address Edit" and a dropdown menu showing "Unfiled". The form contains several fields: "Last name: Carter", "First name: Melanie", "Title:", "Company:", "Work: 212-395-6277", "Home: 212-395-4511", "Fax:", "Other:", "E-mail: mcarter@aol.com", "Address: 2267 5th Avenue", and "City: New York". At the bottom, there are three buttons: "Done", "Details...", and "Note", followed by a scroll arrow icon.

Tap Done

Tip: To create an entry that always appears at the top of the Address List, begin the Last name or Company field with a symbol, as in *If Found Call*. This entry can contain contact information in case you lose your organizer.

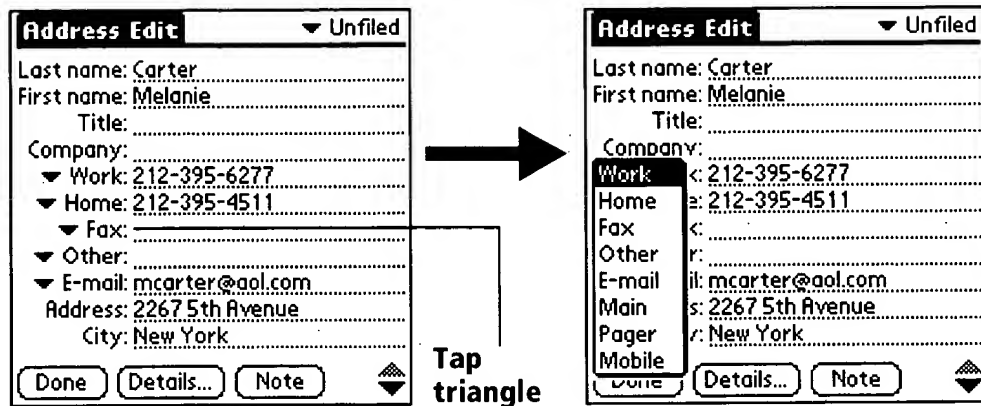
Selecting types of phone numbers

You can select the types of phone numbers or e-mail addresses that you associate with an Address Book entry. Any changes you make apply only to the current entry.

To select other types of phone numbers in an entry:

1. Tap the entry that you want to change.
2. Tap Edit.

3. Tap the pick list next to the label you want to change.



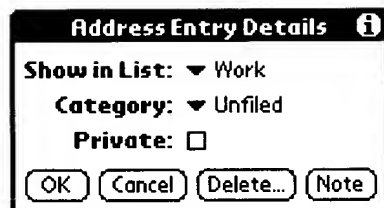
4. Select a new label.

Changing Address Entry details

The Address Entry Details dialog box provides a variety of options that you can associate with an entry.

To open the Address Entry Details dialog box:

1. Tap the entry whose details you want to change.
2. Tap Edit.
3. Tap Details.



4. Select any of the following settings:

Show in List Select which type of phone or other information appears in the Address List screen. Your options are Work, Home, Fax, Other, and E-mail.

Category Assign the entry to a category.

Private Hide this entry when Security is turned on.

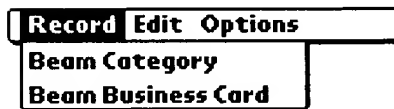
Address Book menus

Address Book menus are shown here for your reference, and Address Book features that are not explained elsewhere in this book are described here.

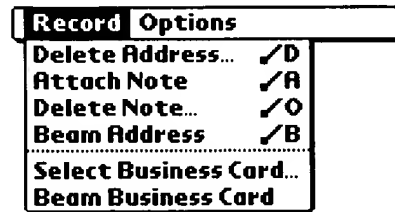
See “Using menus” in Chapter 1 for information about choosing menu commands.

The Record and Options menus differ depending on whether you’re displaying the Address List screen or the Address View screen.

Record menus

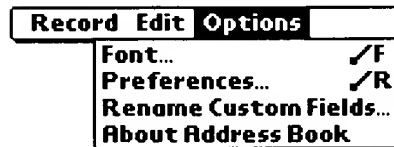


Address List



Address View

Options menus

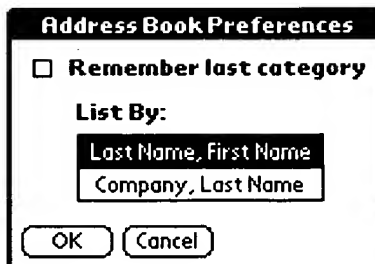


Address List



Address View

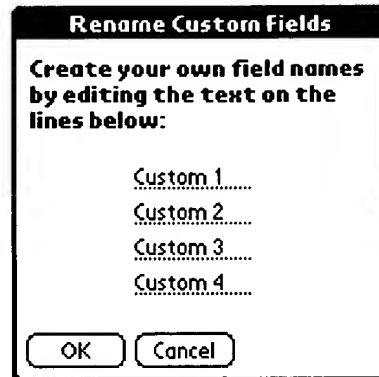
Preferences



- **Remember last category.** Determines how Address Book appears when you return to it from another application. If you select this check box, Address Book shows the last category you selected. If you clear it, Address Book displays the All category.

Rename Custom Fields

These custom fields appear at the end of the Address Edit screen. Rename them to identify the kind of information you enter in them. The names you give the custom fields appear in all entries.


**About Address Book**

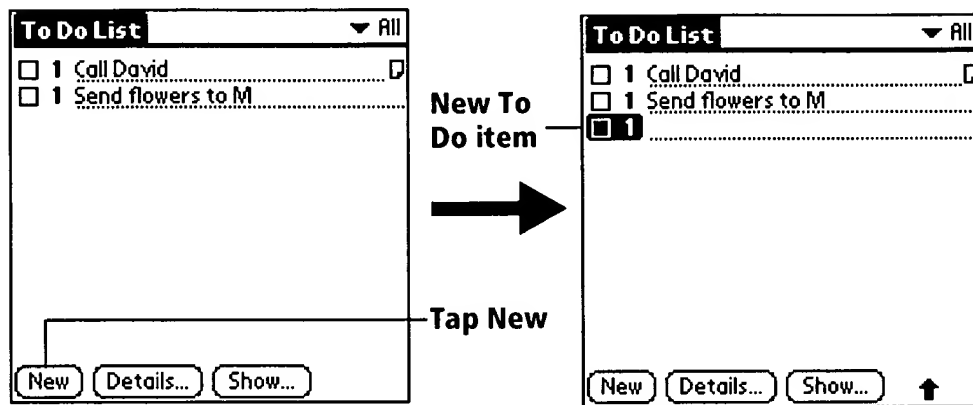
Shows version information for Address Book.

To Do List

A To Do List item is a reminder of some task that you have to complete. A record in To Do List is called an “item.”

To create a To Do List item:

1. Press the To Do List application button  on the front of your organizer to display the To Do List.
2. Tap New.



3. Enter the text of the To Do List item. The text can be longer than one line.
4. Tap anywhere onscreen to deselect the To Do List item.

Tip: If no To Do List item is currently selected, writing in the Graffiti writing area automatically creates a new item.

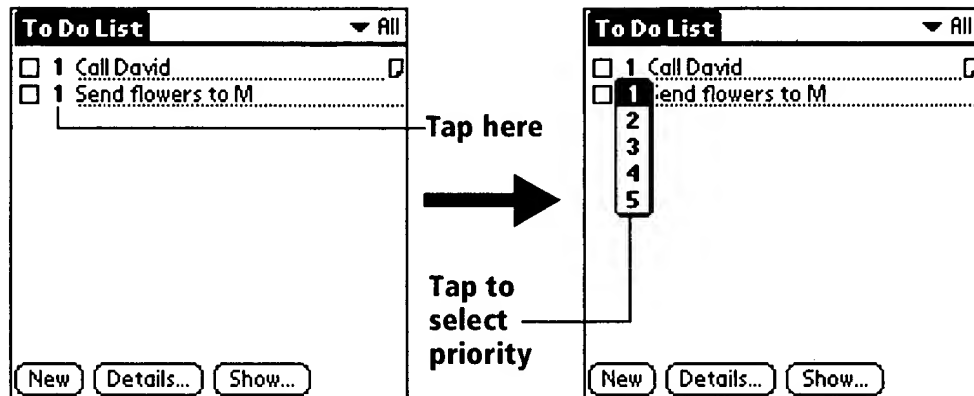
Setting priority

The priority setting for items lets you arrange the tasks in your To Do List according to their importance or urgency. The default setting for the To Do List is to arrange items by priority and due date, with priority 1 items at the top. If you have a number of items in your list, changing an item's priority setting may move its position in the list.

Note: When you create a new To Do List item, its priority is automatically set to level 1, the highest (most important) level. If you select another item first, however, the item you create appears beneath the selected item and is given the same priority as the selected item.

To set the priority of a To Do List item:

1. Tap the Priority number on the left side of the To Do List item.



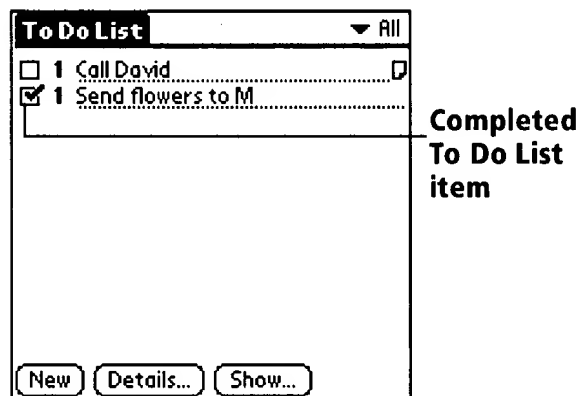
2. Tap the Priority number that you want to set (1 is most important).

Checking off a To Do List item

You can check off a To Do List item to indicate that you've completed it. You can set the To Do List to record the date that you complete the To Do item, and you can choose to show or hide completed items. See "To Do Show Options" later in this chapter.

To check off a To Do List item:

- Tap the check box on the left side of the item.

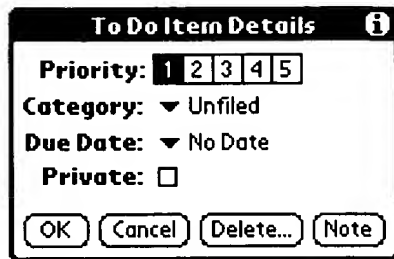


Changing To Do List item details

The To Do Item Details dialog box enables you to change settings for individual items.

To display the To Do Item Details dialog box:

1. Tap the text of the item whose details you want to change.
2. Tap Details.

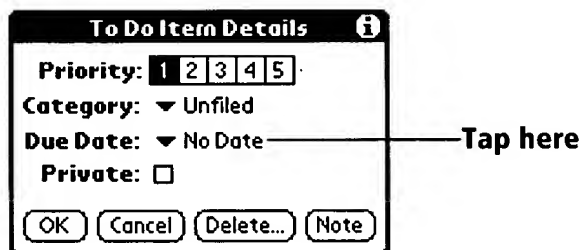


Setting a due date

You can associate a due date with any To Do List item. You can also sort the items that appear in the list based on their due date.

To set a due date for a To Do List item:

1. In the Details dialog box, tap “No Date” to open the Due Date pick list.



2. Tap the date that you want to assign the item:

Today	Assigns the current date.
Tomorrow	Assigns tomorrow's date.
One week later	Assigns the date exactly one week from the current date.
No Date	Removes the due date from the item.
Choose date	Opens the date selector, where you can choose any date that you want for the item.

3. Tap OK.

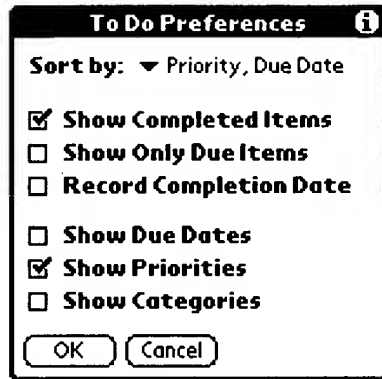
Tip: If you turn on the Show Due Dates option in the To Do Show options dialog, you can tap directly on the due date in the To Do List to open the pick list shown in step 2.

To Do Show Options

The Show Options dialog box enables you to control the appearance of To Do List.

To change the Show Options settings:

1. In To Do List, tap Show.



2. Select any of the following settings:

Show Completed Items

Displays your completed items in the To Do List. If you turn off this setting, your To Do items disappear from the list when you complete (check) them.

Items that no longer appear on the list because you turn off this setting have not been deleted. They are still in the memory of your organizer. Purge completed items to remove them from memory.

Show Only Due Items

Shows only the items that are currently due, past due, or have no due date specified. When this setting is active, items that are not yet due do not appear in the list until their due date.

Record Completion Date

Replaces the due date with the actual date when you complete (check) the item. If you do not assign a due date to an item, the completion date still records when you complete the item.

- Show Due Dates** Displays the due dates associated with items in the To Do List and displays an exclamation mark next to items that remain incomplete after the due date passes.
- Show Priorities** Shows the priority setting for each item.
- Show Categories** Shows the category for each item.

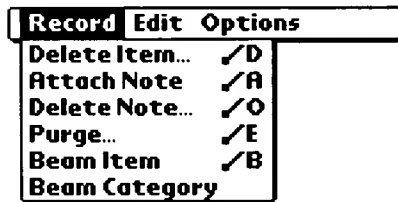
3. Tap OK.

To Do List menus

To Do List menus are shown here for your reference, and To Do List features that are not explained elsewhere in this book are described here.

See “Using menus” in Chapter 1 for information about choosing menu commands.

Record menu



Options menu




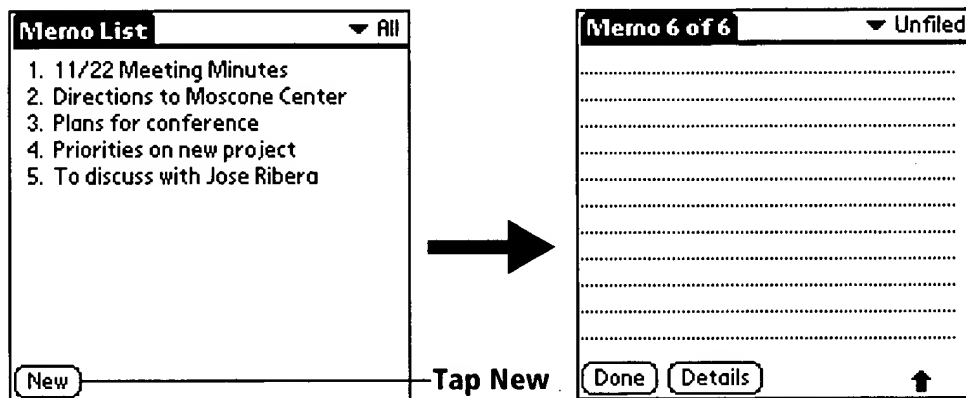
About To Do List Shows version information for To Do List.

Memo Pad

A memo can contain up to 4,000 characters. The number of memos you can store is dependent only on the memory available on your organizer. A record in Memo Pad is called a "memo."

To create a new memo:

1. Press the Memo Pad application button  on the front of your organizer to display the Memo List.
2. Tap New.



Tip: In the Memo List screen, you can also begin writing in the Graffiti writing area to create a new memo. The first letter is automatically capitalized and begins your new memo.

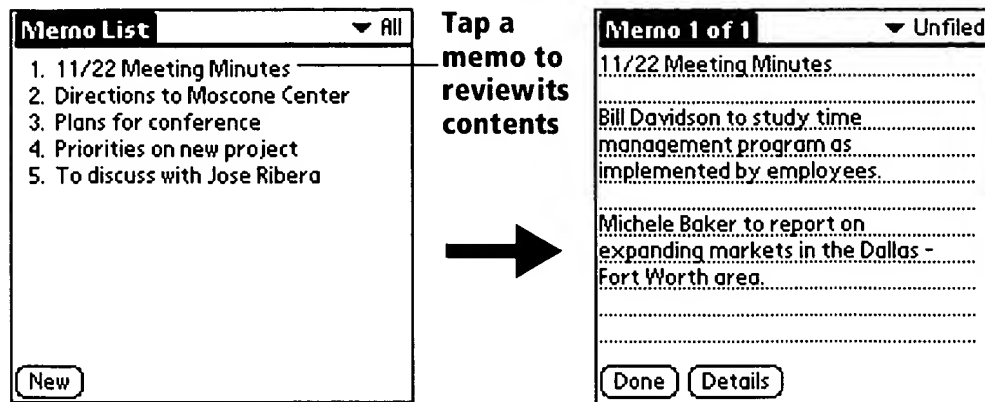
3. Enter the text you want to appear in the memo. Use the carriage return stroke to move down to new lines in the memo.
4. Tap Done.

Reviewing memos

The first line of a memo appears in the Memo List. This makes it easy to locate and review your memos.

To review a memo:

1. In the Memo List, tap the text of the memo.



2. Review or edit the text in the memo.
3. Tap Done.

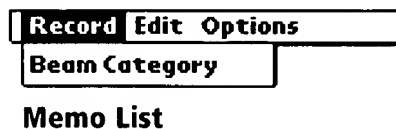
Memo Pad menus

Memo Pad menus are shown here for your reference, and Memo Pad features that are not explained elsewhere in this book are described here.

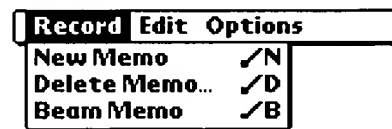
See "Using menus" in Chapter 1 for information about choosing menu commands.

The Record and Options menus differ depending on whether you're displaying the Memo List or an individual memo.

Record menus

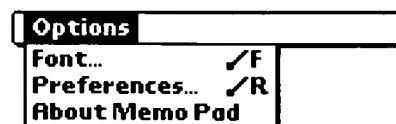


Memo List

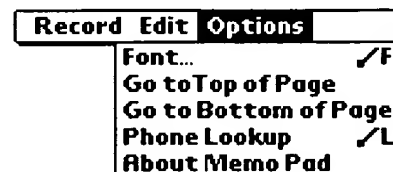


Memo screen

Options menus



Memo List



Memo screen

Go to Top of Page	Moves to the top (first) line of the memo.
Go to Bottom of Page	Moves to the bottom (last) line of the memo.
Preferences	Displays the Memo Preferences dialog box, where you define the sort order for memos.
About Memo Pad	Shows version information for Memo Pad.

Calculator

The Calculator includes several buttons to help you perform calculations.



Clears the last number you entered. Use this button if you make a mistake while entering a number in the middle of a calculation. This button enables you to re-enter the number without starting the calculation over.



Clears the entire calculation and enables you to begin a fresh calculation.



Toggles the current number between a negative and positive value. If you want to enter a negative number, enter the number first *and then press* the +/- button.



Places the current number in memory. Each new number you enter with the M+ button is *added to the total* already stored in memory. The number that you add can be either a calculated value or any number you enter by pressing the number buttons. Pressing this button has no effect on the current calculation (or series of calculations); it merely places the value into memory until it is recalled.



Recalls the stored value from memory and inserts it in the current calculation.




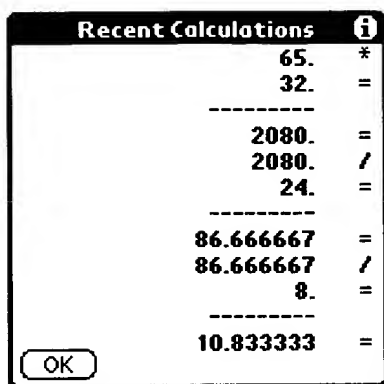
Clears any value that is stored in the Calculator memory.

Recent Calculations

The Recent Calculations command enables you to review the last series of calculations and is particularly useful for confirming a series of “chain” calculations.

To display recent calculations:

1. Tap the Menu icon .
2. Tap Options, and then tap Recent Calculations.



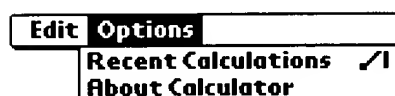
3. After you finish reviewing the calculations, tap OK.

Calculator menus

Calculator menus are shown here for your reference, and Calculator features that are not explained elsewhere in this book are described here.

See "Using menus" in Chapter 1 for information about choosing menu commands.

Options menus




About Calculator

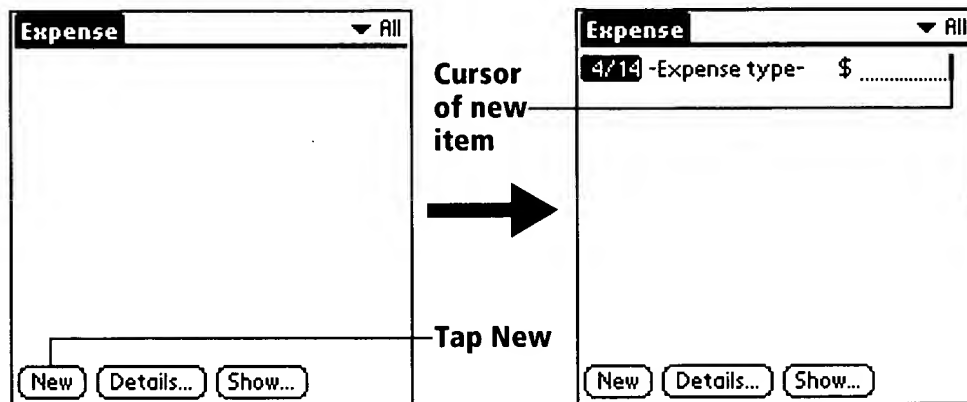
Shows version information for Calculator.

Expense

Expense enables you to record the date, expense type, and the amount that you spent. A record in Expense is called an "item." You can sort your Expense items into categories or add other information that you want to associate with the item.

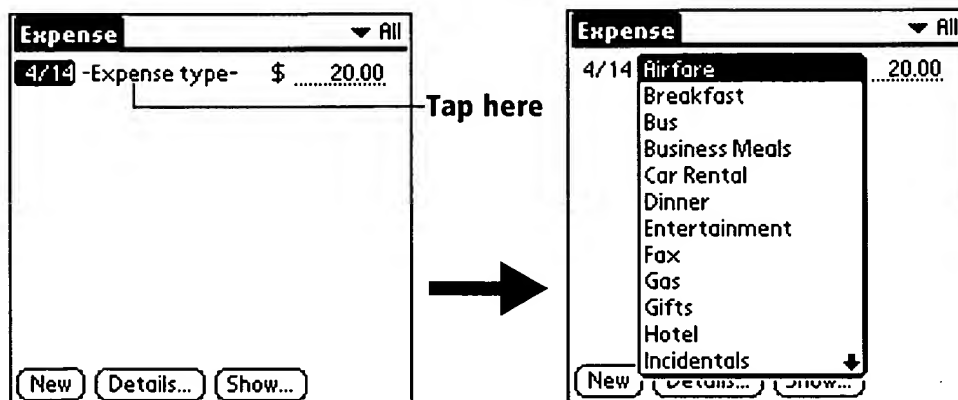
To create an Expense item:

1. Tap the Applications icon .
2. Tap Expense.
3. Tap New.



Tip: You can also create a new Expense item by writing on the number side of the Graffiti writing area while in the Expense List screen. The first number you write begins your new Expense item.

4. Enter the amount of the expense.
5. Tap the Expense type pick list and select a type from the list.



Note: As soon as you select an expense type, your organizer saves your entry. If you do not select an expense type, it does not save the entry.

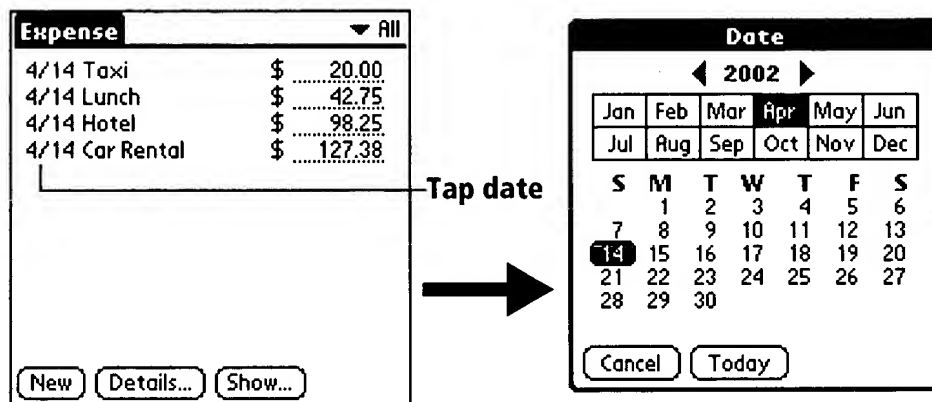
Tip: A quick way to create a new Expense item is to make sure that no Expense item is selected in the Expense List, write the first letter(s) of the expense type, and then write the numerical amount of the Expense item. This technique takes advantage of the automatic fill feature. See "Options menu" later in this chapter for details.

Changing the date of an Expense item

Initially, Expense items appear with the date you enter them. You can use Expense to change the date associated with any Expense item.

To change the date of an Expense item:

1. Tap the Expense item you want to change.
2. Tap the date of the selected item.



3. Tap the new date.

Entering receipt details

Expense provides a variety of options that you can associate with an item. These options appear in the Receipt Details dialog box.

To open the Receipt Details dialog box:

1. Tap the Expense item to which you want to assign details.
2. Tap Details.

The 'Receipt Details' dialog box is shown. It has a title bar 'Receipt Details'. Inside, there are several fields with dropdown menus: 'Category: Unfiled', 'Type: Lunch', 'Payment: Unfiled', and 'Currency: \$'. Below these are text input fields for 'Vendor:', 'City:', and 'Attendees: Who...'. At the bottom, there are four buttons: 'OK', 'Cancel', 'Delete', and 'Note', followed by an upward-pointing arrow.

3. Select any of the following options:

Category	See "Categorizing records" earlier in this chapter.
Type	Opens a pick list of expense types.
Payment	Lets you choose the payment method used to pay the Expense item. If the item is prepaid (such as airline tickets supplied by your company), you can choose Prepaid to place your expense in the appropriate company-paid cell of your printed expense report spreadsheet. See "Transferring your data to Microsoft Excel" later in this chapter for more information.
Currency	Enables you to choose the type of currency used to pay the Expense item. The default currency unit is defined in the Preferences dialog box. You can also display up to four other common types of currency. See "Customizing the Currency pick list" later in this chapter for more information.
Vendor and City	Lets you record the name of the vendor (usually a company) associated with the expense and the city where the expense was incurred. For example, a business lunch might be at Rosie's Cafe (Vendor) in San Francisco (City).
Attendees	See "Looking up names to add to expense records" earlier in this chapter.

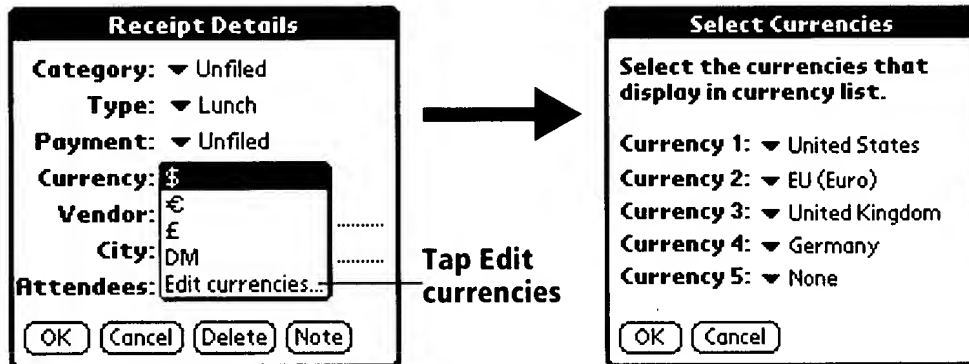
4. Tap OK.

Customizing the Currency pick list

You can select the currencies and symbols that appear in the Currency pick list.


To customize the Currency pick list:

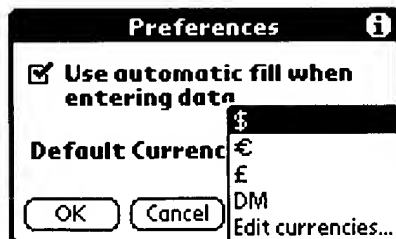
1. Tap the Currency pick list in the Receipt Details dialog box, and then select Edit currencies.



2. Tap each Currency pick list and select the country whose currency you want to display on that line.
3. Tap OK to close the Select Currencies dialog box.
4. Tap OK.

To change your default currency:

1. Open Expense.
2. Tap the Menu icon .
3. Tap Options, and then tap Preferences.
4. Tap the Default Currency pick list.
5. Tap the currency symbol you want to appear in Expense.




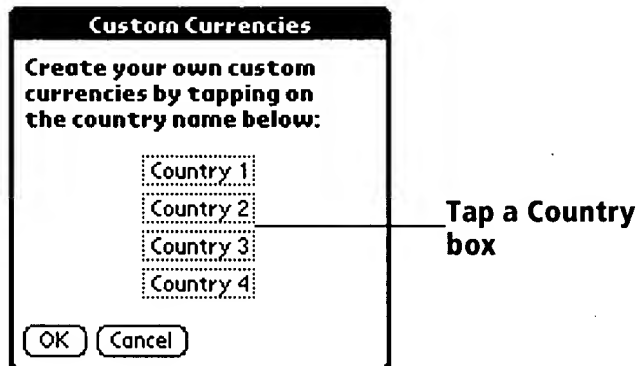
6. Tap OK.

Defining a custom currency symbol

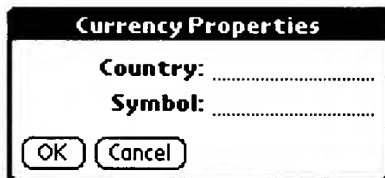
If the currency you want to use is not in the list of countries, you can create your own custom country and currency symbol.

To define a custom currency symbol:

1. Tap the Menu icon .
2. Tap Options, and then tap Custom Currencies.
3. Tap one of the four Country boxes.



4. Enter the name of the country and the symbol that you want to appear in Expense.



5. Tap OK to close the Currency Properties dialog box.
6. Tap OK.

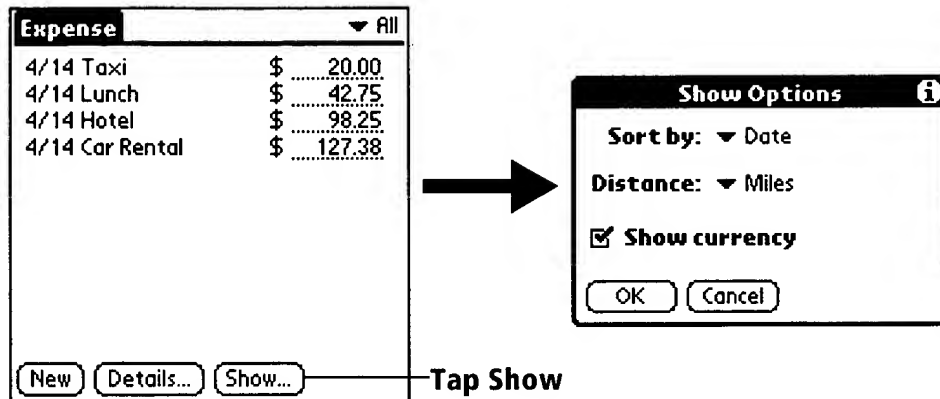
Note: If you want to use your custom currency symbol as the default for all Expense items, select the symbol in the Preferences dialog box. If you want to use your custom currency symbol only for a particular Expense item, select the symbol in the Receipt Details dialog box associated with that item.

Show Options

Show Options define the sort order and other settings that relate to your Expense items.

To open the Show Options dialog box:

1. In the Expense List, tap Show.
2. Select any of the options.



- | | |
|----------------------|--|
| Sort by | Enables you to sort expense items by date or type. |
| Distance | Enables you to display Mileage entries in miles or kilometers. |
| Show currency | Shows or hides the currency symbol in the Expense List. |

3. Tap OK.

Transferring your data to Microsoft Excel

After you enter your expenses into the Expense application on your organizer, Palm Desktop software enables you to view and print the data with your computer.

Note: You need Microsoft Excel version 5.0 (or later) to view and print your Expense data using one of the provided templates. Microsoft Excel is *not* included with the Palm V organizer package. The procedures in this section also assume that you have installed Palm Desktop software. See "Palm Desktop organizer software" in Chapter 1 for more information.

Displaying the euro on your desktop computer

When you perform a HotSync operation, the euro symbol is transferred to your Desktop application like any other piece of data on your organizer. The symbol appears in your Desktop application, however, only if you are using fonts that support the euro symbol.

These fonts are part of the operating system on your desktop computer. They do not reside with your Desktop application, and they are not produced by Palm Computing.

Operating System	Euro Support
Mac OS	Contained in Mac OS 8.5 or higher. For more information, visit the following web site: http://til.info.apple.com/techinfo.nsf/artnum/n22222
Windows 95	Download free font upgrades from the Web. For more information, visit the following web site: http://www.microsoft.com/windows/euro.asp
Windows 98	Includes all the necessary fonts and drivers.
Windows NT 4.0	Download free font upgrades from the Web. For more information, visit the following web site: http://www.microsoft.com/windows/euro.asp

Printing the euro

Even with operating system support, problems may arise while printing documents that contain the euro. When a font is present on both the printer and the computer, the printer font is used by default to increase printing speed. If the printer font does not include the euro, a box prints instead of the euro symbol.

You can work around this problem by sending a bitmap image of the euro to the printer or by not using the printer's built-in fonts (if allowed).

Creating or printing an expense report

Palm Desktop software makes it quick and easy to view and print your Expense data in a Microsoft Excel spreadsheet.

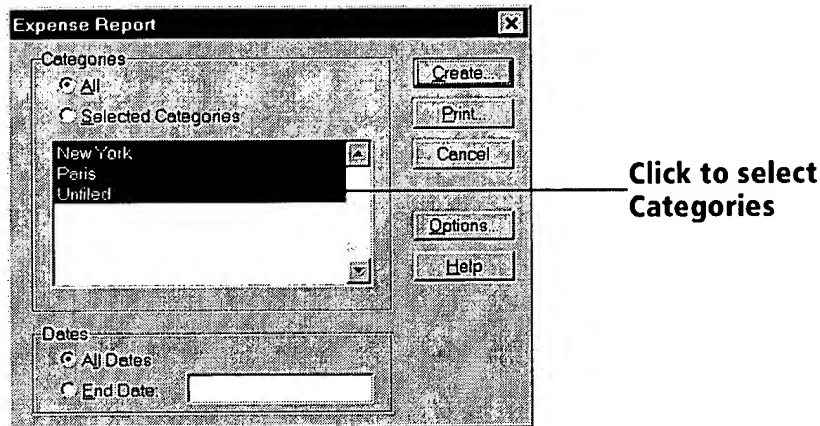
To create or print an expense report:

1. Perform a HotSync operation to transfer your latest Expense data to your computer.

2. Click Expense in Palm Desktop software to open Microsoft Excel and the Expense Report configuration dialog box.

Note: If you launch Expense from the Start menu instead of Palm Desktop software, you must first choose your organizer user name.

3. Click the expense category that you want.



Tip: You can press Ctrl+click to select multiple categories. To print the expenses associated with all of your Expense categories, select All in the Categories group.

4. If you want to define an end date for the expense report, enter the date in the End Date box.

Note: If you do not specify an end date, all expense entries for the selected categories appear — up to the date of the last HotSync operation.

5. Do one of the following:

Click Print to display the expense report in the Print Preview window, and then click Print in the Microsoft Excel window to print your expense report.

Click Create to display a Microsoft Excel spreadsheet containing your expense data. Your data appears in Microsoft Excel spreadsheet form. You can enter information, make formatting changes, and save and print the file in the normal manner.

Using expense report templates

Palm Desktop software includes several expense report templates. When you use one of these templates, you can edit your expense data in Microsoft Excel.

The templates have the extension .xlt and are stored in the template folder in the Palm Desktop software directory on your computer. To see what a template looks like before you use it, open the template in Microsoft Excel. For example, the template Sample2.xlt looks like this:

The screenshot shows the 'Sample2.xlt' expense report template in Microsoft Excel. The template is organized into several sections for recording expenses:

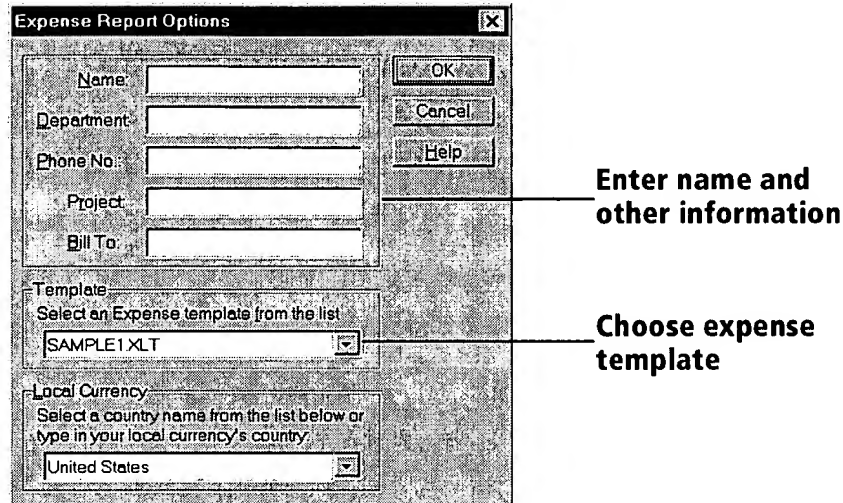
- Travel Expense Report:** Includes fields for Employee name, Expense number, Department, Date, and Bill to.
- LODGING:** Includes fields for Lodging & Hotel, Laundry, Tips, and Lodging total.
- MEALS:** Includes fields for Breakfast, Lunch & Snacks, Dinner, and Meals total.
- BUSINESS:** Includes fields for Business meals, Conference, Entertainment, and Business total.
- TRANSPORTATION:** Includes fields for Airfare, Auto Rental, Auto Maint/Gas, Local Transportation, Tolls/Parking, Miles @ \$\$\$\$ / mile, and Trans. total.
- MISCELLANEOUS:** Includes fields for Gifts, Telephone & Fax, Supplies, Postage, Other, and Misc. total.
- TOTAL:** A section for summarizing the total expenses.
- Less cash advance:** A field for recording cash advances.
- Due employee:** A field for recording amounts due to the employee.
- Due company:** A field for recording amounts due to the company.
- Approval:** A section for recording approvals, including fields for Approver name, Expense number, Date, and Employee name.

The template is displayed in a grid format with rows and columns for data entry. The title bar of the Excel window shows 'Sample2.xlt'.

If you want to streamline or customize your expense reports, you can change these templates. For example, you can add your company name to a template. See Appendix C for information on changing templates.

To view your expense data using a Microsoft Excel template:

1. Display your expense data in a Microsoft Excel spreadsheet as described in the previous procedure.
2. Click Options.



3. Enter name, department, and other information as necessary for your expense report.
4. Click the Templates menu; then select an expense template.

Note: If you want to create your own custom expense template and have it appear in the Templates menu, see Appendix C for more information.

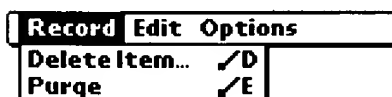
5. Click OK.

Expense menus

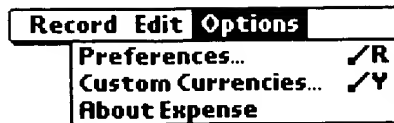
Expense menus are shown here for your reference, and Expense features that are not explained elsewhere in this book are described here.

See "Using menus" in Chapter 1 for information about choosing menu commands.

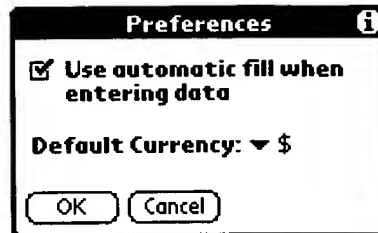
Record menu



Options menu



Preferences



- **Use automatic fill.** Lets you select an expense type by writing the first letter of an expense type in the Graffiti writing area. For example, if you write the letter "T," it enters the "Taxi" expense type. Writing "T" and then "E" enters "Telephone" which is the first expense type beginning with the letters "TE."

About Expense Shows version information for Expense.

Chapter 5

Communicating Using Your Organizer

The previous chapter described the features of your Palm V™ organizer that help you stay organized. This chapter describes the features that help you stay connected.

- **Managing desktop E-Mail:** Using your organizer, you can read, reply to, compose, and delete e-mail from your desktop E-Mail application while you're away from your desk.
- **IR beaming:** The infrared port located at the top of your organizer lets you send data from your organizer — including entire applications — to any other Palm Computing® platform handheld that's close by and also equipped with an IR port.

Managing desktop E-Mail away from your desk



Mail lets you manage the e-mail that you send and receive through the E-Mail application on your desktop computer. You can read, reply to, compose, and delete e-mail on your organizer; but to send or receive e-mail, you must perform a HotSync® operation either locally, using the organizer cradle or infrared communications, or remotely, using a Palm V™ Modem.

The key to Mail is that it truly synchronizes the mail in the Inbox of your desktop E-Mail application with the mail on your organizer. For example, if you delete e-mail items from Mail, your next HotSync operation also deletes the e-mail items from your desktop E-Mail application, so you never have to delete e-mail items twice. Similarly, if you read an e-mail item on your organizer and leave it in your Inbox, your next HotSync operation marks it as read in your desktop E-Mail application.

In Mail, you can do the following:

- View, delete, file, and reply to incoming mail.
- Create outgoing e-mail items and drafts of e-mail items.
- Create simple or complex filters, which allow you to decide the type of e-mail that your organizer retrieves from your desktop E-mail application.
- Use your organizer to send and retrieve e-mail items from your desktop E-Mail application via the cradle or infrared communications.

Setting up Mail on the desktop

Before you use Mail for the first time, make sure your desktop E-Mail application is up and running. You must also set up Palm™ Desktop software for use with your desktop E-Mail application.

Your organizer supports a number of desktop E-Mail applications, such as Microsoft Exchange (version 4.0 or higher), QUALCOMM Eudora (version 3.0.3 or higher), and Lotus cc:Mail (versions 2.5, 6.0, and 7.0). You can see the full list of the supported applications when you set up Mail.


If your desktop E-Mail application does not appear on the list, you may still be able to manage your desktop E-Mail application from your organizer by means of special connection software, called a conduit, that lets you synchronize your desktop E-Mail application and your organizer. Contact the vendor of your E-Mail application or visit the web site <http://www.palm.com> for more information.

Note: The following instructions assume that you have already installed Palm Desktop software on your computer and that you did not set up Mail during the installation. If you have not yet installed the Palm Desktop software, the installation procedure prompts you to set up Mail as part of the Palm Desktop software installation.

To set up Mail:

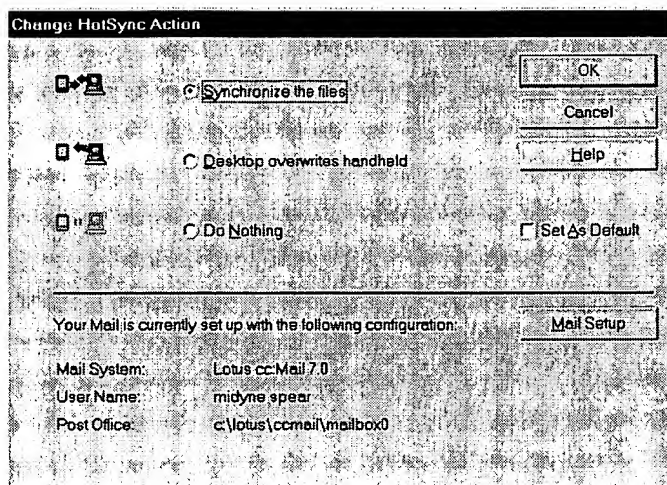
1. Click Start in the Windows taskbar.
2. Highlight Programs, highlight Palm Desktop software, and then click Mail Setup to begin setup.
3. Follow the instructions onscreen to set up your organizer for use with your desktop E-Mail application.

To select HotSync options:

1. Click the HotSync icon ™ in the Windows system tray (bottom-right corner of the taskbar).
2. Choose Custom.

Tip: You can also choose Custom from the HotSync menu in Palm Desktop software.

3. Select Mail in the list box.
4. Click Change.



5. Click one of the following settings:


Synchronize the files Synchronizes the mail on your organizer and your desktop E-Mail application.

Desktop overwrites handheld Replaces the mail on your organizer with the mail in your desktop E-Mail application. You should use this option only if, for some reason, the two inboxes get out of sync.

Do Nothing Turns off communication between your organizer and desktop E-Mail application.

Note: Changing the HotSync setting from the default affects only the *next* HotSync operation. Thereafter, the HotSync Action reverts to the default setting.

To change your Mail setup options:

1. Click the HotSync icon  in the Windows system tray.
2. Choose Custom.

Tip: You can also choose Custom from the HotSync menu in Palm Desktop software.



3. Select Mail in the list box.
4. Click Change.
5. Modify your settings as needed.
6. Click OK.

Synchronizing Mail with your E-Mail application

After you enable and configure Mail, you need to perform a HotSync operation to synchronize Mail with your desktop E-Mail application. For a complete explanation of HotSync technology, see Chapter 6.

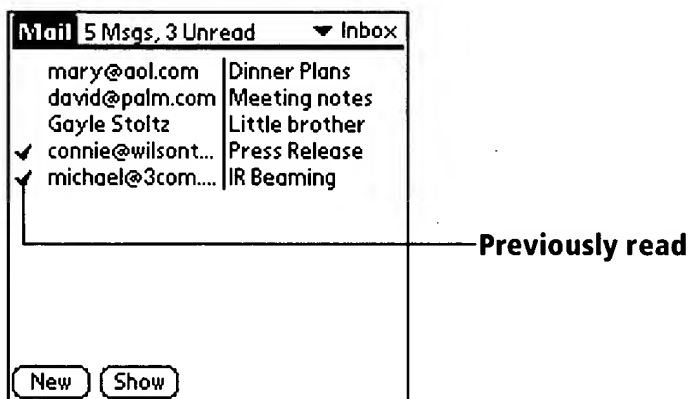
Opening the Mail application on your organizer

To open Mail:

1. Tap the Applications icon .
2. Tap the Mail icon .

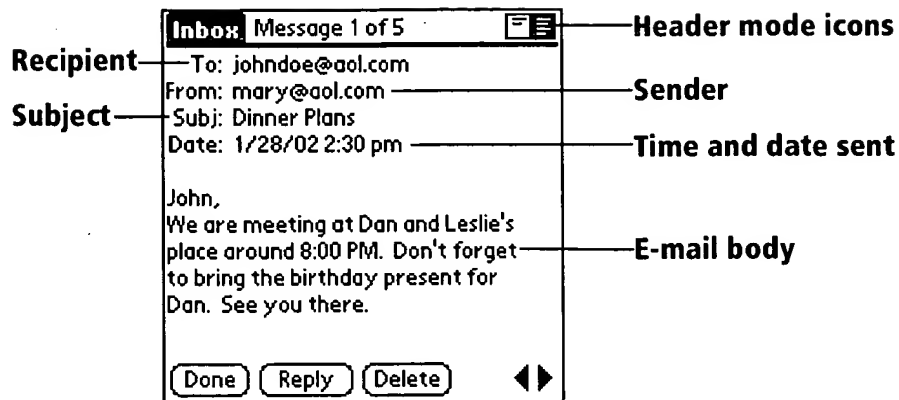
Viewing e-mail items

The Message List displays a list of your incoming e-mail items, who sent them, and the date they were received. E-mail items you've read have a check next to them. High-priority e-mail items appear in bold.



To open an e-mail item:

- Tap an e-mail item to open it.



To close an e-mail item:

- Tap Done to close the e-mail item.

Displaying full header information

By default, Mail displays abbreviated header information, which comprises only the From: and Subj: fields. The full header provides complete information about the sender, receiver, and copied recipients, in addition to the subject and date the e-mail item was created. Mail uses the header type you select for all your e-mail items.

To display full header information:

1. Open an e-mail item.
2. Tap the Complete Header icon.

Tip: To redisplay the abbreviated header, tap the Abbreviated Header icon.

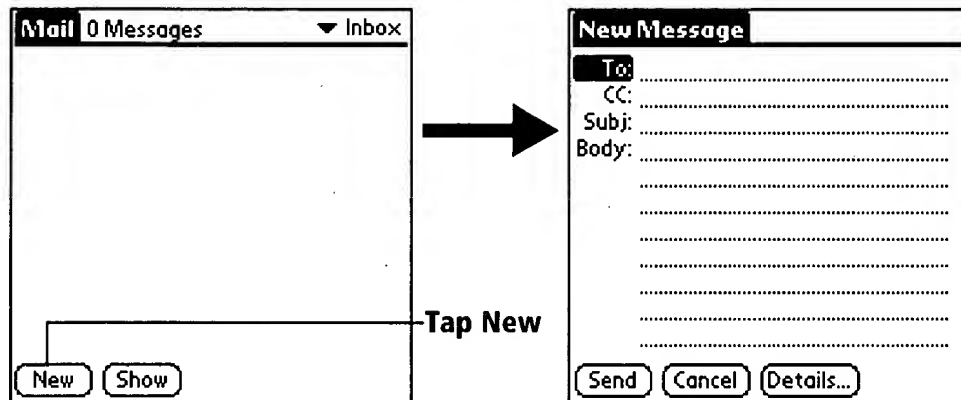
Creating e-mail items

You create e-mail items with your organizer the same way you create e-mail with your desktop E-mail application: you identify the recipient(s) of the e-mail item, define a subject, and create the body of the e-mail item.

You create original e-mail items and replies in the New Message screen. All e-mail items must, at the very least, contain information in the To: and Subj: fields.

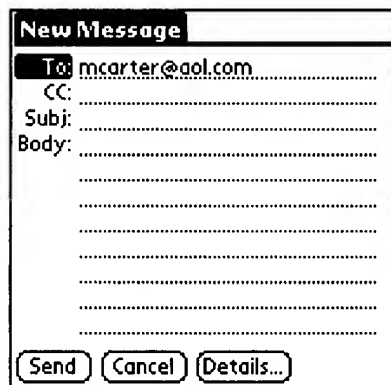
To create an e-mail item:

1. Tap New.



Tip: You can also create an e-mail item by tapping New from the Message menu.

2. Enter the e-mail address of the recipient.

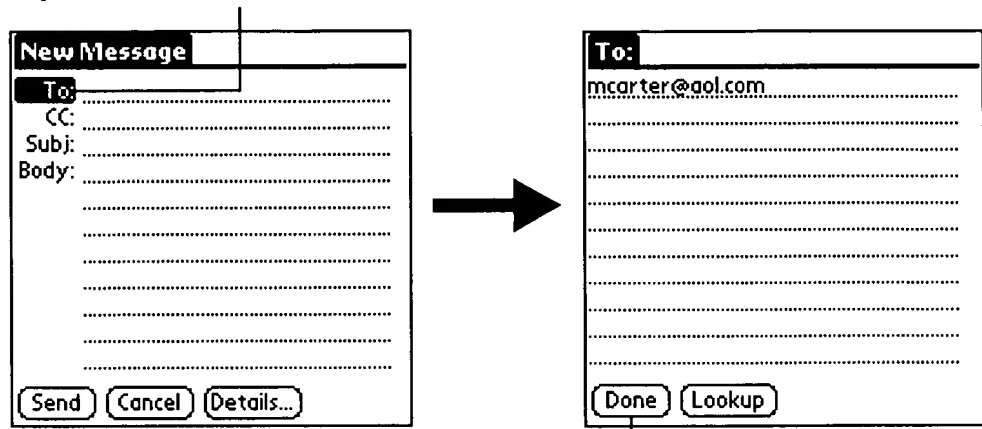


Note: Enter the address as if you were entering it from your desktop E-Mail application. For example, network users sending an e-mail item to a user on the same network do not need to add Internet information, such as @mycorp.com.

3. To send a copy of this e-mail item to additional recipients, tap the CC: field, and then enter the e-mail addresses of the additional recipients, separating the addresses with a comma followed by a space.
4. Tap the Subj: field and enter a subject for your e-mail item.
5. Tap the Body: field and enter the text of your e-mail item.

Tip: If the address, CC, subject, or body exceeds the capacity of the screen display, tap the name of the field (for example, tap "To:") to expand that field. Tap the Done button to return to the New Message screen.

Tap the name of the field to open



Tap to return to New Message screen

To reply to an e-mail item:

1. Tap an e-mail item in the Message List to display it onscreen.
2. Tap Reply.
3. Select whom you want to receive the reply: Sender only, All recipients, or someone who didn't see the original e-mail item (Forward).



4. Select whether you want to include original text or comment original text.
5. Tap OK.
6. Enter the text of your reply.

Tip: You have several options including setting the priority. See "Adding details to e-mail items" later in this chapter.

7. Tap Send to place your reply in the Outbox.

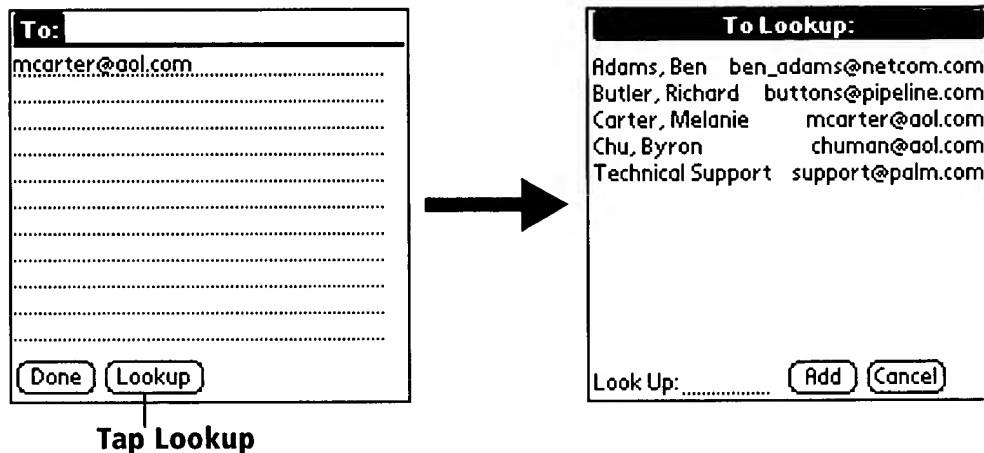
Looking up an address

To identify the recipient of an e-mail item, you need to enter that person's e-mail address. You can do this either by entering the data directly into the field or by using the Look Up command to access the information in your Address Book.

To look up an e-mail address:

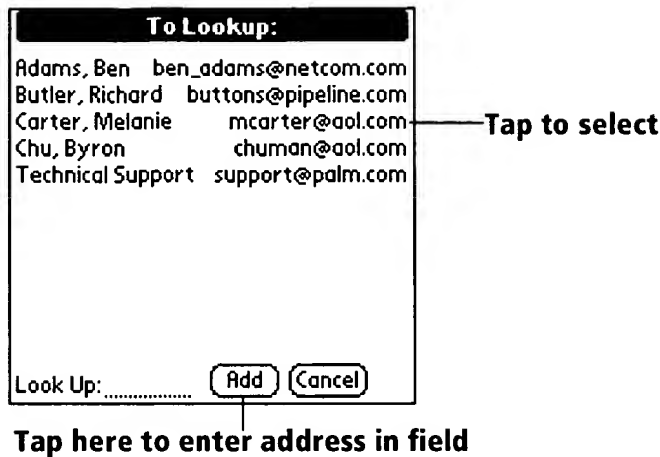
1. Tap either the To: or CC: field name to expand it.
2. Enter the first few letters of the last name of the person whose address you want to find.
3. Tap Lookup.
4. If the letters you enter identify a unique listing from your Address Book, your organizer completes the address for you. If not, the Lookup dialog box appears and lists all records that contain information in an E-mail field.

Tip: You can also open the Look Up dialog box in the New Message screen by tapping Lookup from the Options menu or by using the Graffiti® Command stroke /L.



Tap Lookup

5. Enter the first letter of the entry you want to find to scroll to the first entry that begins with that letter. If you write an additional letter, the list scrolls to the first entry that starts with those two letters. For example, writing an "s" scrolls to "Sanders," and writing "sm" scrolls to "Smith."
6. Tap an address to select it.
7. Tap Add.



Adding details to e-mail items

Before you send your e-mail item, you can attach additional attributes to it, such as a signature or a priority level. These features are dependent on the desktop E-mail application you use. If your application does not support the attribute you select, your organizer cannot attach that attribute to the e-mail item.

The following details are available:

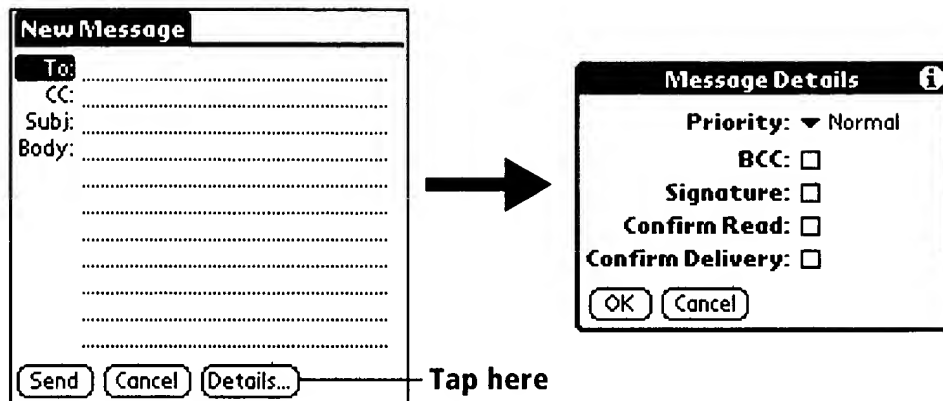
Priority	Flags an e-mail item as High, Normal, or Low priority.
BCC	Creates a blind carbon copy field in the New Message screen.
Signature	Attaches previously defined text as the closing of an e-mail item. See "Adding a signature to your e-mail item" later in this chapter.
Confirm Read	Requests a confirmation telling you when the e-mail item was read.
Confirm Delivery	Requests a confirmation telling you when the e-mail item was delivered.

Note: The Priority and BCC settings are valid only for the current e-mail item and must be set for each item you create.

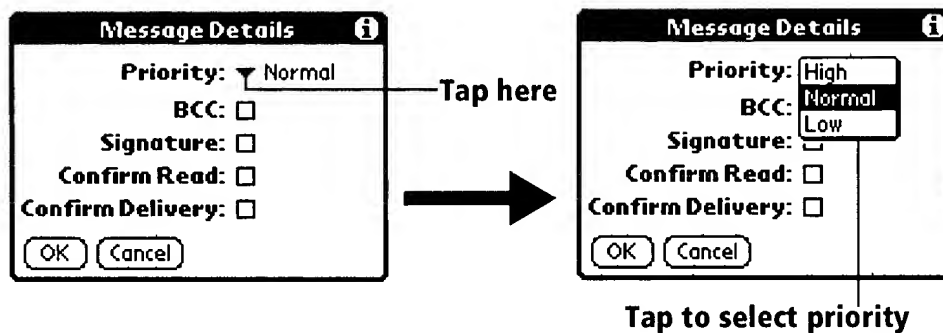
Setting a priority

To set a priority for your e-mail item:

1. In the New Message screen, tap Details.



2. Tap the Priority pick list and select the priority you want.



3. Tap OK.

Tip: Your organizer can flag e-mail items with a specific priority only if your desktop E-Mail application supports this feature.

Sending a blind carbon copy

To add a BCC field to your e-mail item:

1. In the New Message screen, tap Details.
2. Tap the BCC check box to select it.
3. Tap OK.

To add a signature to your e-mail item:

1. In the New Message screen, tap Details.
2. Tap the Signature check box to select it and add your signature to the e-mail item.

Note: The check box stays selected, so all subsequent e-mail items you create will also contain your signature until you deselect the Signature option.

3. Tap OK.

Note: The signature does not display in your e-mail item; only your recipient sees the signature.

Requesting confirmations**To receive a confirmation when your e-mail item is read:**

1. In the New Message screen, tap Details.
2. Tap the Confirm Read check box to select it.
3. Tap OK.

To receive a confirmation when your e-mail item is delivered:

1. In the New Message screen, tap Details.
2. Select the Confirm Delivery check box to select it.
3. Tap OK.

Storing e-mail to be sent later

When you send e-mail from your organizer, it actually stores the e-mail in the Outbox folder until the next time you synchronize your organizer with your computer. During synchronization, all e-mail stored in the Outbox folder is transferred to the Outbox folder in your desktop E-Mail application. E-mail created on your organizer is sent out the next time you send mail from your desktop E-Mail application.

To send e-mail:

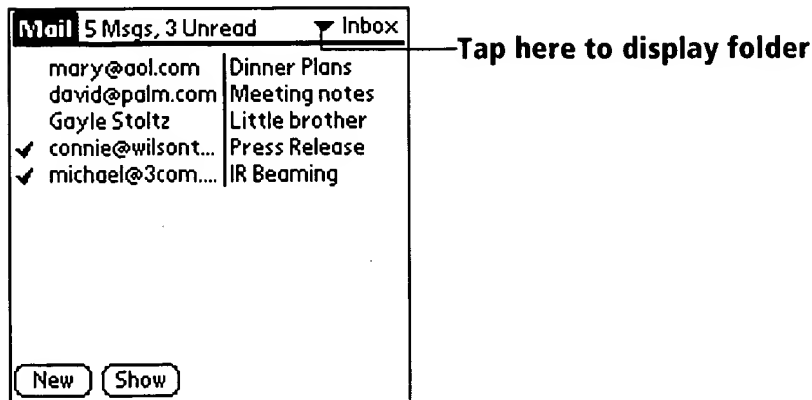
- After you create an e-mail item, tap Send.

Editing unsent e-mail

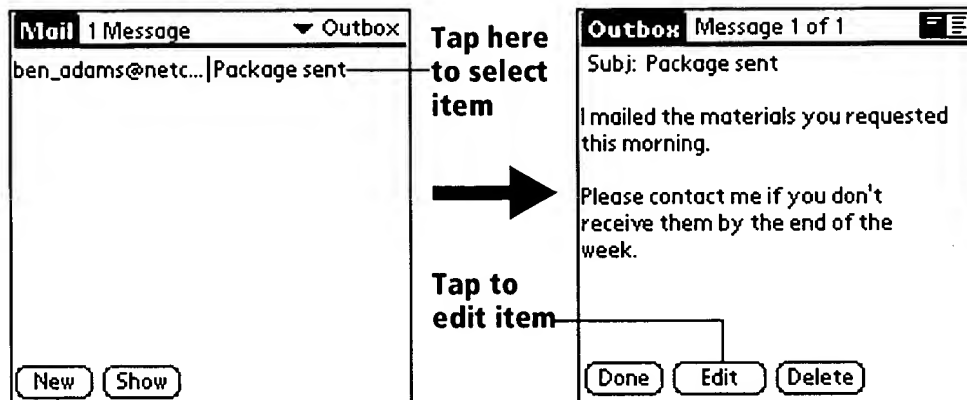
You can make changes to an e-mail that has not yet been sent, as long as you have not yet performed a HotSync operation. When you edit an e-mail item, your organizer removes the item from the Outbox folder and takes you back to the New Message screen, where you can edit the item and resend it, save it as a draft, or delete it.

To retrieve an e-mail item:

1. In the Message List, tap Outbox from the pick list in the upper-right corner.



2. Tap the e-mail item you want to retrieve.




3. Tap Edit.

Draft e-mail

Sometimes you may not want to send an e-mail item immediately; for example, you may want to add additional information before sending it. Your organizer stores such e-mail items in the Draft folder until you are ready to edit them again.

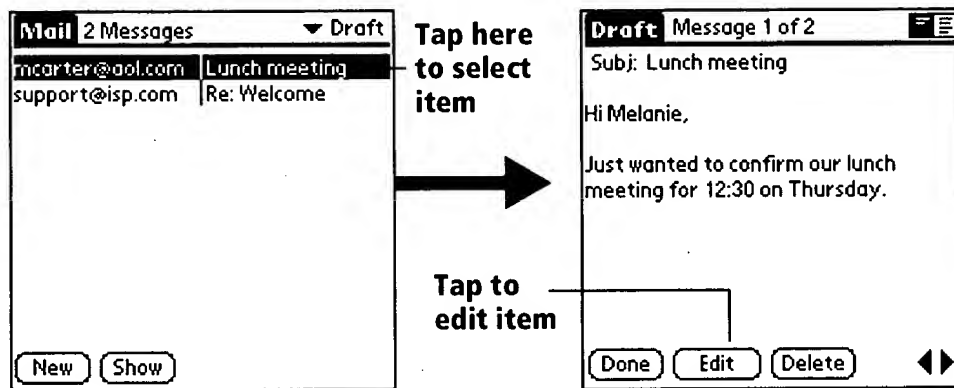
Note: When you're creating or editing an e-mail item, you can also save the item as a draft by canceling it. When you cancel an item, your organizer opens a dialog asking if you want to save the e-mail item. If you tap Yes, your organizer saves the item in the Draft folder.

To save an e-mail item as a draft:

1. Create an e-mail item.
2. Tap the Menu icon .
3. Tap Message, and then tap Save Draft.

To edit an e-mail item saved as a draft:

1. In the Message List, tap Draft from the pick list in the upper-right corner.
2. Tap the draft you want to display.




3. Tap Edit.
4. Enter your changes; then either save the e-mail item again as a draft, or tap Send to move the item to your Outbox folder.

Filing e-mail

Your organizer can store e-mail you receive or create in the Filed folder. The contents of this folder do not automatically synchronize with your desktop E-Mail application during a HotSync operation. Your organizer, however, stores a backup copy of the Filed folder on your computer hard disk.

To file e-mail:

1. Open an e-mail item.
2. Tap the Menu icon .
3. Tap Message, and then tap File.
4. Tap No to save the e-mail item and move it to the Filed folder, or tap Yes to file the item and keep a copy in the Inbox.

To remove e-mail from the Filed folder:

1. In the Message List, tap Filed from the pick list in the upper-right corner.
2. Tap the e-mail item you want to restore.
3. Tap Edit to display and modify the item.

Tip: After you display and modify the e-mail item, you can send it, save it as a draft, or return it to the Filed folder.

Deleting e-mail

Your organizer stores deleted e-mail in the Deleted folder until you perform the next HotSync operation. If you delete an e-mail item from the organizer, it is also deleted from your desktop E-Mail application when you perform the next HotSync operation.

To delete e-mail:

1. Open the e-mail item you want to delete.
2. Tap Delete.
3. If you selected the Preferences option to confirm deletion, tap Yes.

Removing e-mail from the Deleted folder

You can reverse the deletion of an e-mail item (by removing it from the Deleted folder) as long as you have not performed a HotSync operation or purged the contents of the Deleted folder.

To remove an e-mail item you received from the Deleted folder:

1. In the Message List, tap Deleted from the pick list in the upper-right corner.
2. Tap the e-mail item you want to restore.
3. Tap Undelete to move the selected item to the Inbox and mark it as read.

To remove an e-mail item you created from the Deleted folder:


1. In the Message List, tap Deleted from the pick list in the upper-right corner.
2. Tap the e-mail item you want to restore.
3. Tap Edit to display and modify the item.

Note: After you display and modify the e-mail item, you can send it or save it as a draft.

Purging deleted e-mail

Because your organizer stores deleted e-mail in the Deleted folder until you perform a HotSync operation, deleted e-mail can monopolize storage space. To avoid or correct this problem, purge the contents of your Deleted folder. E-mail that you purge is still deleted from your desktop E-Mail application when you perform the next HotSync operation.

To purge the contents of the Deleted folder:

1. Tap the Menu icon .
2. Tap Message, and then tap Purge Deleted.
3. Tap Yes.

Note: You cannot restore e-mail items after you purge them.

Message List options

Message List options enable you to manage the way the Message List displays information.

Folders

Your organizer provides folders for categorizing your mail. The Message List displays the e-mail items in the folder you select.

To select a folder:

1. Tap the pick list in the upper-right corner to open the list of folders:

Inbox	Contains the e-mail from your desktop E-Mail application Inbox, minus any that you have excluded using filtering options. See “Creating special filters” later in this chapter.
Outbox	Contains the e-mail you created and sent on the organizer since the last HotSync operation.
Deleted	Contains the e-mail you deleted since the last HotSync operation.
Filed	Contains the e-mail you want to store on the organizer.
Draft	Contains the e-mail you created using the organizer but are not yet ready to send.

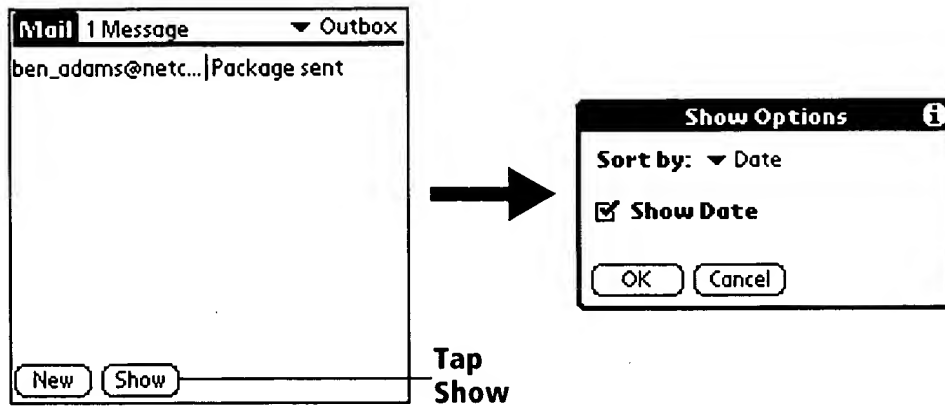
2. Select the folder you want to display in the Message List screen.

Date column

The Date column is optional in the Message List. By default, the Date column is hidden to increase the available screen space.

To show the Date column:

1. In the Message List, tap Show.



2. Tap the Show Date check box to select it.
3. Tap OK.

Sorting the Message List

You can sort e-mail items by the date sent, by sender, or by subject.

Note: High-priority e-mail items always appear first, no matter how you sort the list.

To sort the Message List:

1. In the Message List, tap Show.
2. Tap the Sort by pick list and select one of the following options:


Date	Sorts e-mail by date and displays the most recent e-mail item at the top of the screen.
Sender	Sorts e-mail by the sender's user name and displays items in ascending alphabetical order, based on the first word of the From: field.
Subject	Sorts e-mail by the subject and displays items in ascending alphabetical order, based on the first word of the Subj: field.

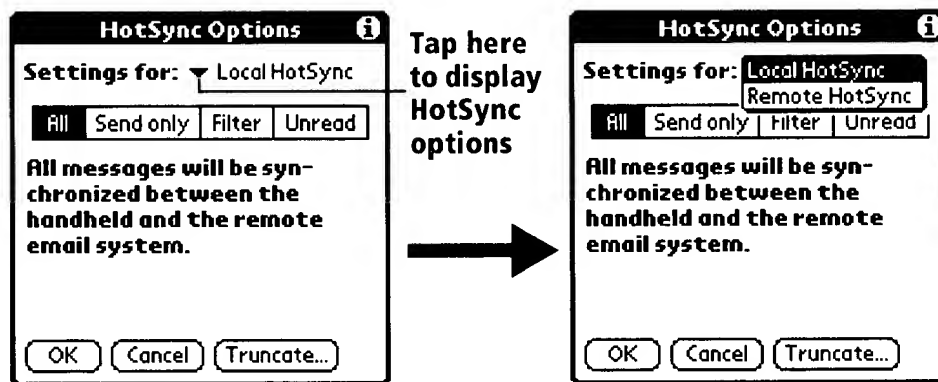
3. Tap OK.

HotSync options

HotSync options enable you to manage your e-mail more effectively by selecting which e-mail items download when you synchronize your computer and your organizer. You can define different settings for local and remote synchronization. For example, you may want to download all of your e-mail during local synchronization and only urgent e-mail during remote synchronization. Once defined, your organizer determines if synchronization is occurring locally or remotely and uses the appropriate settings for the HotSync operation.

To open the HotSync Options dialog box:

1. Tap the Menu icon .
2. Tap Options, and then tap HotSync Options.
3. Tap the Settings for pick list and select Local HotSync or Remote HotSync.



Note: For more information about Local and Remote HotSync operations, see Chapter 6.

4. Tap the filtering option you want to apply:

- | | |
|------------------|---|
| All | During synchronization, all e-mail items in your desktop E-Mail Inbox synchronize with your organizer, and all e-mail items in your organizer Outbox are sent to your desktop E-Mail application. |
| Send Only | During synchronization, only the e-mail items in your organizer Outbox are sent to your desktop E-Mail application; from there, they are sent to their destinations. |

- Filter** During synchronization, all e-mail items in your organizer Outbox are sent to your desktop E-Mail application, and items in your desktop E-Mail Inbox that meet specific criteria download to your organizer. When you select the Filter setting, the HotSync Options dialog box opens and displays additional filter settings. See “Creating special filters” later in this chapter.
- Unread** During synchronization, only unread e-mail items download to your organizer from your desktop E-Mail Inbox, and all items in your organizer Outbox are sent to your desktop E-Mail application.
- Note:** The All setting does not mean that all information included in each e-mail item downloads to your organizer. Truncation settings (explained in a following section) for long e-mail items still apply. Also, Mail never downloads any attachments to your organizer. The e-mail item and any text information appear, but the attachment is left in your desktop E-Mail application.
5. If you selected All, Send only, or Unread, tap OK. If you selected Filter, continue to the next section.

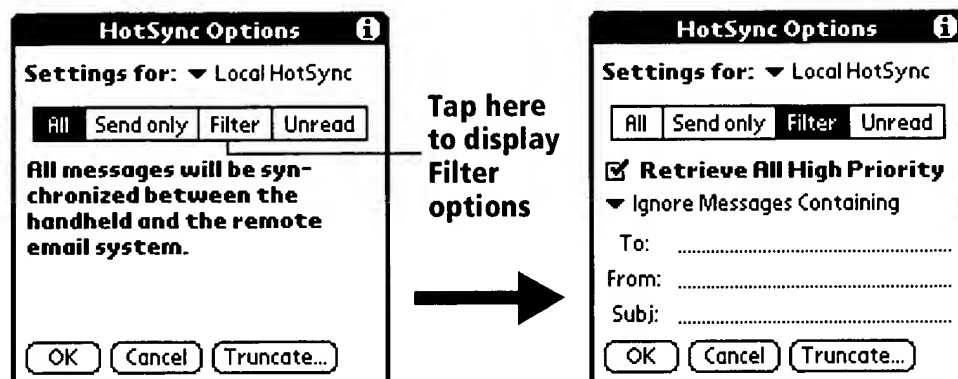
Creating special filters

You can create special filters to control the type of e-mail items that download to your organizer during synchronization. Special filters work on the premise of ignoring or retrieving items that contain specific information in their header fields.

To create a special filter, you must decide whether you want to ignore or retrieve certain e-mail items. Then, based on that decision, you must tell your organizer what it needs to look for in the To:, From:, and Subj: fields to single out those e-mail items.

To access the special filter settings:

- Tap the Filter box in the HotSync Options dialog box.

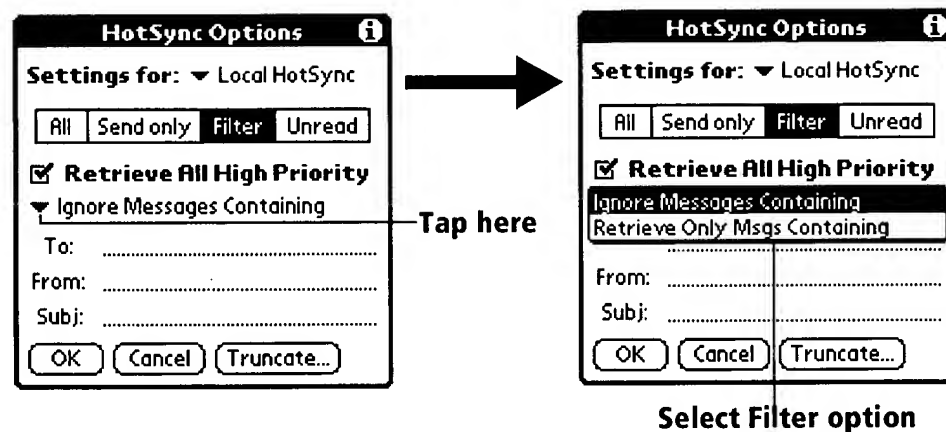


Ignoring or receiving e-mail

The first step in establishing a special filter is to determine whether you want to ignore or retrieve e-mail that matches the information you specify.

To define whether to ignore or receive e-mail:

- Tap the pick list in the center of the HotSync Options dialog box and select one of the following settings:



Ignore Messages Containing

Tells your organizer to *exclude* the e-mail items that meet the criteria you define and download *all other e-mail items* during synchronization. In general, this filter downloads more e-mail during synchronization because it blocks only one defined subset of e-mail.

Retrieve Only Msgs Containing Tells your organizer to *include* only the e-mail items that meet the criteria you define and to ignore all other e-mail items during synchronization. This filter has the potential to block more e-mail during synchronization because it downloads only one subset of e-mail.

Defining filter strings

E-mail items are filtered based on the information contained in their To:, From:, and Subj: fields. The information that defines what your organizer is looking for is called a *filter string*. You create a filter string by listing the words you want your organizer to find and separating them with either a comma or a space. Each word in the filter string is joined by an implicit OR, so you do not need to enter logical connectors like AND or OR.

To create a more complex filter, you can define filter strings for the To:, From:, and Subj: fields simultaneously. Your organizer joins the filter strings for these fields using an implicit AND; once again, you do not need to add the logical connector. Your organizer does that for you.

For example, suppose you want to receive only e-mail items from John Smith (jsmith@aol.com) or Jack Jones (jjones@aol.com) concerning the Apollo Project. You would create the following filter strings:

In the To: field: jsmith@aol.com, jjones@aol.com

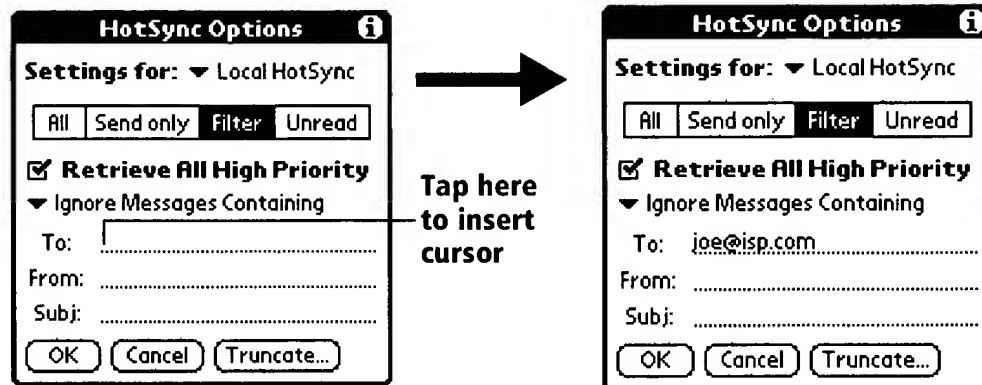
In the Subj: field: Apollo Project

Your organizer interprets this as, "Accept e-mail items about the Apollo Project from John Smith or Jack Jones. Do not accept e-mail items from other people. Do not accept e-mail items from John or Jack about any other subject."

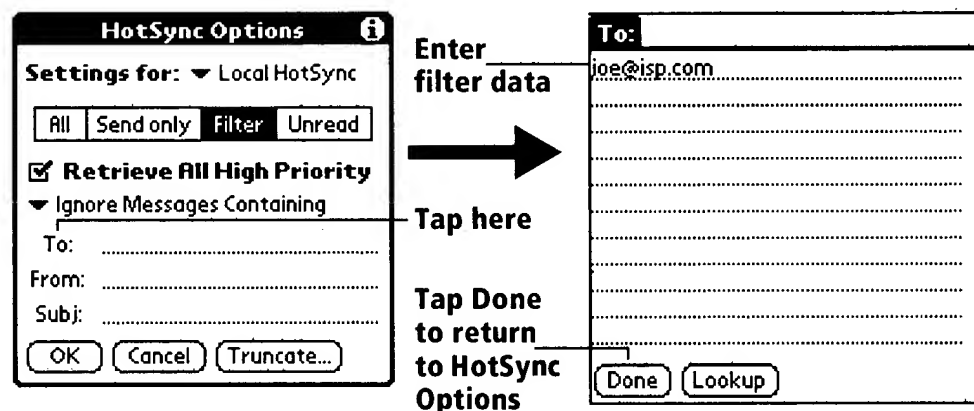
When you define a string, note that your organizer searches for any instance of that *sequence* of characters. For example, if you create a filter that retrieves only e-mail items containing the string "info," your organizer considers "info," "rainforest" and "kinfolk" appropriate matches.

To define a filter string:

1. Tap a header field in the HotSync Options dialog box.



2. Enter your filter string, using commas or spaces to separate the words. Do not add connectors, such as AND or OR, between words in a string.
3. If your string exceeds the length of the field, tap the name of the field to display the Notes screen for that header field. For more information about header field Notes screens, see "Creating e-mail items" earlier in this chapter.



4. Tap Done to return to the HotSync Options dialog box.
5. Tap OK.

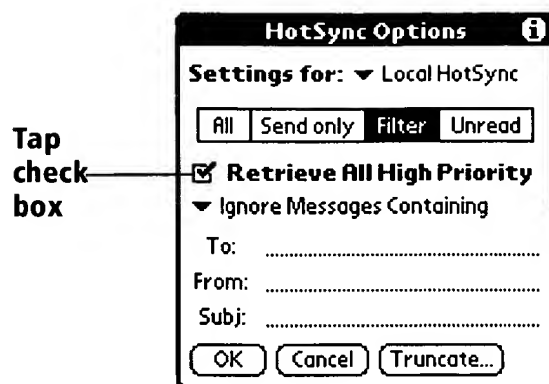
High-priority e-mail

The Retrieve All High Priority setting lets you retrieve e-mail items marked high-priority, even if those items would have been blocked by a defined filter.

To retrieve high-priority e-mail items:

1. Tap the Filter box in the HotSync Options dialog box.

2. Tap the Retrieve All High Priority check box to select it.



3. Tap OK.

Note: This setting is applicable only if your E-Mail application has the capacity to flag high-priority e-mail items.

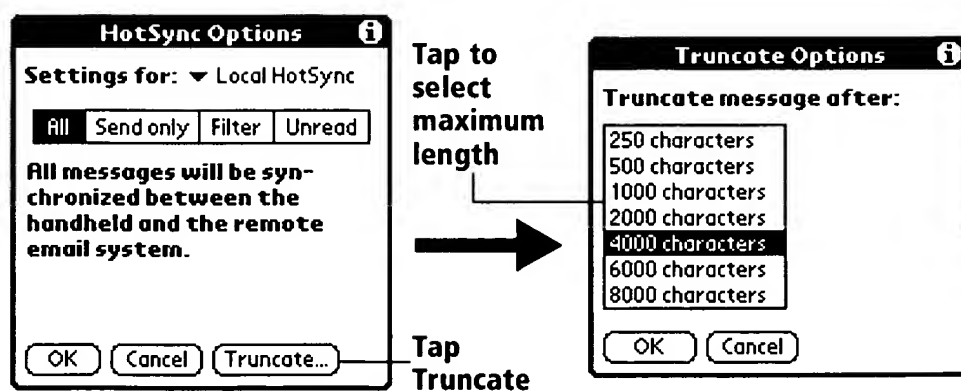
Truncating e-mail items

The Truncate feature lets you set a point at which long e-mail items truncate when downloading to your organizer. By default, this Truncate value is 4,000 characters. By truncating long messages, you reduce the time it takes to synchronize your desktop E-Mail and Mail, as well as the amount of storage space e-mail uses on your organizer.

Note: Truncation is separate and independent from filtering.

To truncate e-mail items:

1. Tap Truncate in the HotSync Options dialog box.



2. Tap to select the truncation setting you want.

Tip: If you select the maximum setting, messages can be 8,000 characters; longer messages are truncated. If you select a lower value, you'll have more room for e-mail items.

3. Tap OK.

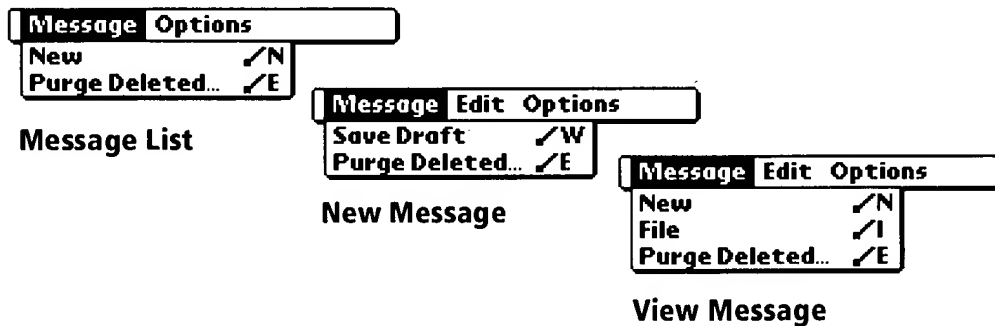
Mail menus

Mail menus are shown here for your reference, and Mail features that are not explained elsewhere in this book are described here.

See “Using menus” in Chapter 1 for information about choosing menu commands.

Message menus

The Message menu varies depending on whether you are viewing an e-mail item, creating an e-mail item, or viewing the Message List.



Options menus

The Options menu varies depending on whether you are creating or editing an e-mail item.



About Mail Shows version information for Mail.

Beaming information


Your organizer is equipped with an IR (infrared) port that you can use to beam information to another Palm Computing platform handheld that's close by and also has an IR port. The IR port is located at the top of the organizer, behind the small dark shield.

You can beam the following information between Palm Computing platform handhelds:


- The record currently displayed in Date Book, Address Book, To Do List, or Memo Pad
- All records of the category currently displayed in Address Book, To Do List, or Memo Pad
- A special Address Book record that you designate as your business card, containing information you want to exchange with business contacts
- An application installed in RAM memory

Note: You can also perform HotSync operations using the IR port. See "IR HotSync operations" in Chapter 6 for more details.

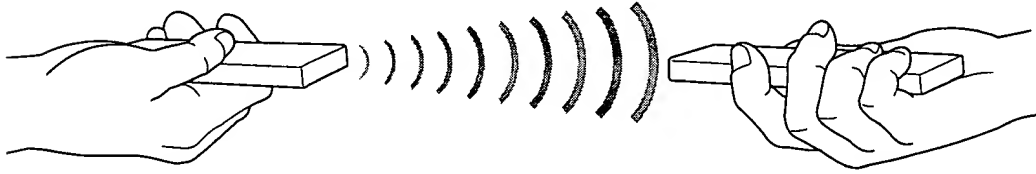
To select a business card:

1. Create an Address Book record that contains the information you want on your business card.
2. Tap the Menu icon .
3. Tap Record, and then tap Select Business Card.
4. Tap Yes.

To beam a record, business card, or category of records:


1. Locate the record, business card, or category you want to beam.
2. Tap the Menu icon .
3. Tap Record, and then tap one of the following:
 - The Beam command for an individual record
 - In Address Book only: Beam Business Card
 - Beam Category
4. When the Beam Status dialog box appears, point the IR port directly at the IR port of the receiving organizer.

Tip: For best results, Palm V organizers should be between 10 centimeters (approximately 4 inches) and 1 meter (approximately 39 inches) apart, and the path between the two organizers must be clear of obstacles. Beaming distance to other Palm Computing platform handhelds may be different.



5. Wait for the Beam Status dialog box to indicate that the transfer is complete before you continue working on your organizer.

To beam an application:

1. Open the Applications Launcher.
2. Tap the Menu icon .
3. Tap App, and then tap Beam.
4. Tap the application you want to transfer.

Note: Some applications are copy-protected and cannot be beamed. These are listed with a lock icon next to them.


5. Tap Beam.
6. When the Beam Status dialog box appears, point the IR port directly at the IR port of the receiving organizer.
7. Wait for the Beam Status dialog box to indicate that the transfer is complete before you continue working on your organizer.

To receive beamed information:

1. Turn on your organizer.
2. Point the IR port directly at the IR port of the transmitting organizer to open the Beam Status dialog box.
3. Tap Yes.
4. Wait for the Beam Status dialog box to indicate that the transfer is complete, and then tap OK to display the new entry.

Incoming records are placed in the Unfiled category.

Tips on beaming information

- You can press the Address Book application button  for about two seconds to beam your business card.
- You can set the full-screen pen stroke to beam the current entry. See “Pen preferences” in Chapter 7 for more information.
- You can use the Graffiti Command stroke /B to beam the current entry.

Chapter 6

Advanced HotSync® Operations

HotSync® technology enables you to synchronize data between one or more Palm Computing® platform handhelds and Palm™ Desktop software or another PIM such as Microsoft Outlook. To synchronize data, you must connect your Palm V™ organizer and Palm Desktop software either directly by placing your organizer in the cradle attached to your computer or using infrared communications, or indirectly with a Palm V™ Modem or via a network using the network HotSync technology.

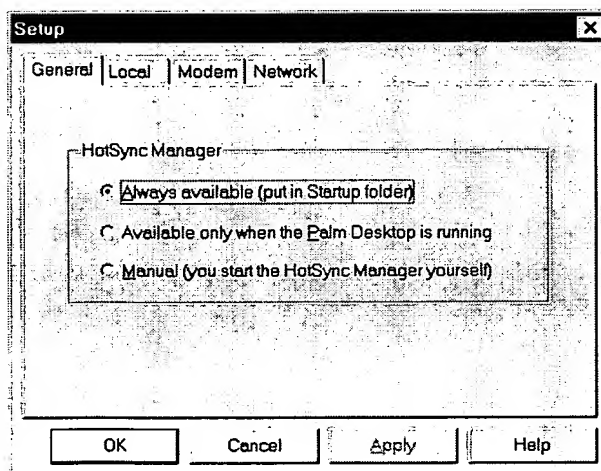
This chapter describes how to select HotSync options and perform a HotSync operation via infrared communications, a modem, or a network. See “Exchanging and updating data: HotSync operations” in Chapter 4 for information about performing your first and subsequent local HotSync operations.

Selecting HotSync setup options

You can choose when you want HotSync Manager to run. If necessary, you can adjust the local and modem HotSync settings as well.

To set the HotSync options:

1. Click the HotSync Manager icon in the Windows system tray.
2. Choose Setup.



3. Click the General tab and select one of the following options:

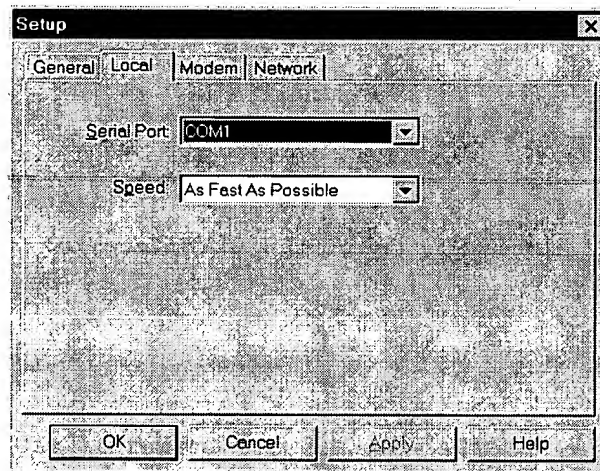
Always available Adds HotSync Manager to the Startup folder and constantly monitors the communication port for synchronization requests from your organizer. With this option, the HotSync Manager synchronizes data even when Palm Desktop software is not running.

Available only when Palm Desktop software is running Starts HotSync Manager and monitors requests automatically when you open Palm Desktop software.

Manual Monitors requests only when you select HotSync Manager from the Start menu.

Tip: If you're not sure which option to use, keep the default setting: Always available.

4. Click the Local tab to display the settings for the connection between your computer and the organizer cradle, and adjust the following options as needed.



Serial Port

Identifies the port that Palm Desktop software uses to communicate with the cradle. This selection should match the number of the port to which you connected the cradle.

Note: Your organizer cannot share this port with an internal modem or other device. See "Palm V components" in Chapter 1 if you have trouble identifying the serial port.

Speed

Determines the speed at which data is transferred between your organizer and Palm Desktop software. Try the As Fast As Possible rate first, and adjust downward if you experience problems. This setting allows Palm Desktop software and your organizer to find and use the fastest speed.

5. Click the Modem tab to display the modem settings and adjust the options as needed. See "Conducting a HotSync operation via modem" later in this chapter for more information.
6. If you are attached to a network, click the Network tab to display the network settings and adjust the options as needed. See "Conducting a HotSync operation via a network" later in this chapter for more information.
7. Click OK.


Customizing HotSync application settings

For each application, you can define a set of options that determines how records are handled during synchronization. These options are called a “conduit.” By default, a HotSync operation synchronizes all files between the organizer and Palm Desktop software.

In general, you should leave the settings to synchronize all files. The only reason you might want to change these settings is to overwrite data on either your organizer or Palm Desktop software, or to avoid synchronizing a particular type of file because you don’t use it.

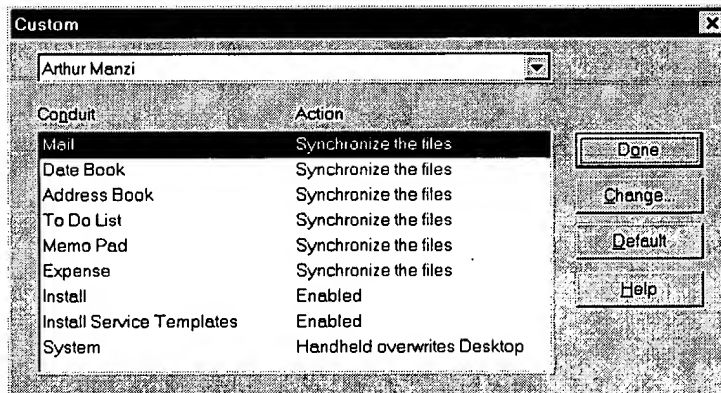
In addition to the conduits for Date Book, Address Book, To Do List, Memo Pad, and Expense, Palm Desktop software includes System and Install conduits. The System conduit backs up the system information stored on your organizer, including Graffiti® ShortCuts. The Install conduit installs add-on applications on your organizer.

To customize HotSync application settings:

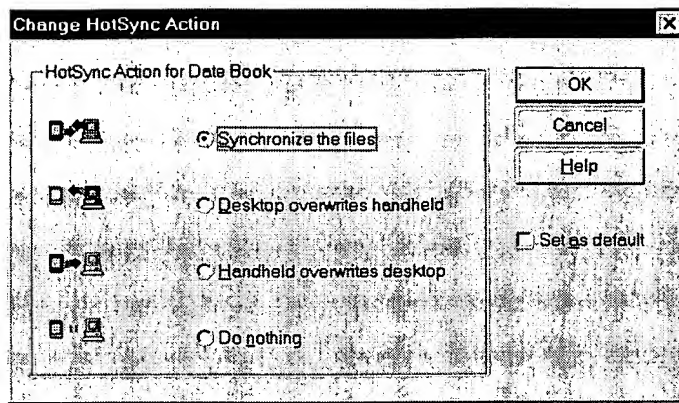
1. Click the HotSync icon ™ in the Windows system tray (bottom-right corner of the taskbar).

Tip: You can also click the HotSync command on the Palm Desktop software menu bar.

2. From the HotSync Manager menu, choose Custom.



3. Select the appropriate user name from the list.
4. Select an application in the Conduit list.
5. Click Change.



6. Click the direction in which you want to write data, or click Do Nothing to skip data transfer for an application.

Note: Changing the HotSync setting from the default affects only the *next* HotSync operation. Thereafter, the HotSync Actions revert to their default settings. To use a new setting on an ongoing basis, select the Set As Default box. Thereafter, whatever you selected as the default setting is used when you click the Default button in the Custom dialog.

7. Click OK.
8. Repeat steps 4 through 7 to change conduit settings for other applications.
9. Click Done to activate your settings.

IR HotSync operations

Your organizer is equipped with an infrared (IR) port that supports the IrCOMM implementation of the standards for infrared communication established by the Infrared Data Association (IrDA). This means that not only can you beam data to another Palm Computing platform handheld that's equipped with an IR port, but you can also beam data to a cell phone and any other device that supports the IrCOMM implementation of the IrDA standards.

Most importantly, you can use the IR port to perform HotSync operations; you don't need your cradle. This is especially useful if you travel with an infrared-enabled laptop. You simply enable infrared communication on your laptop and organizer and follow the steps in "Performing an IR HotSync operation" later in this section.

Preparing your computer for infrared communication

Before you can perform a HotSync operation using the IR port, the computer with which you want to synchronize must fulfill these requirements:

- Your computer must support the IrCOMM implementation of the IrDA standards.
- Your computer must have an enabled infrared port that's built into the computer, or an enabled infrared device attached to the computer.

Desktop computers are likely to require an infrared device attached to a physical COM port. Laptops are likely to have a built-in IR port, so no external device is necessary. Your computer must also have an installed infrared driver.

Check your computer's documentation to learn if the computer supports infrared communication. If your computer is a Macintosh G3, or uses Microsoft Windows 98, infrared communication is built into the operating system. Some versions of the Macintosh iMac also have built-in infrared communication.

The following procedure explains how to find out if your Windows 95 computer has an infrared driver installed.

To check if your Windows 95 computer supports infrared communication:


1. In the Windows taskbar, click Start.
2. Choose Settings, and then choose Control Panel.

3. In the Control Panel, look for the Infrared icon.

If the icon is there, your computer is enabled for infrared communication. If it isn't there, you need to install an infrared driver.

Note: If you have an external infrared device attached to your computer, a driver is probably included with the device. Consult the documentation included with the device for information on installing the required driver.

To install a Windows 95 infrared driver:

1. Click the HotSync Manager icon  in the Windows system tray and choose Setup. Click the tabs and note the COM ports being used by the HotSync Manager. You need this information later.
2. Go to this web site:
<http://www.microsoft.com/windows/downloads>
3. Follow the links to the Windows 95 IrDA 2.0 (Infrared Driver), and follow the instructions to download the driver.
4. Close your Internet browser if it's in the way.
5. Find the file W95ir.exe on your computer.

Before you go to the next step, be sure this file is in a folder where you want to store the infrared driver.

6. Double-click W95ir.exe.

A window lists the files that are unzipping onto your hard disk. When the title bar displays Finished, close this window.

7. Double-click Setup.exe to begin installation. This file is in the folder where you unzipped W95ir.exe.

The Add Infrared Device Wizard appears.

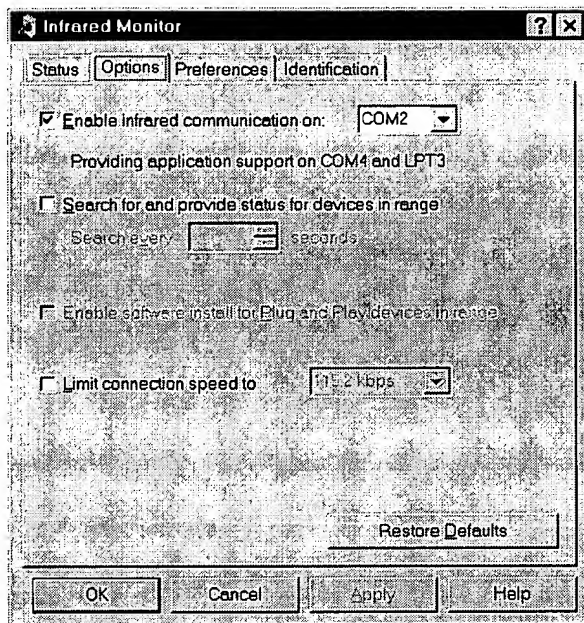
8. Click Next.
9. Accept the defaults provided until the Wizard asks you to select an infrared port. Be sure to select an available communications port. Do not select the port that the HotSync Manager currently uses.
10. Continue the rest of the installation using the defaults provided.

If an alert appears telling you that there is a communication port conflict, click OK and proceed.

After you install the infrared driver, check the ports used by your computer for infrared communication.

To check the ports used for infrared communication:

1. In the Windows taskbar, click Start, choose Settings, and then choose Control Panel.
2. Double-click Infrared.
3. Click the Options tab.
4. Select Enable infrared communication.



The COM port displayed in the drop-down box is the port where your infrared device is attached. It should be *different* from any port used by the HotSync Manager.

5. Make a note of which port is listed as “providing application support.” You need this information to configure the HotSync Manager for infrared communication.


This port (COM4 in this example) is the simulated port, the channel through which the actual infrared communication takes place between your computer and your organizer.

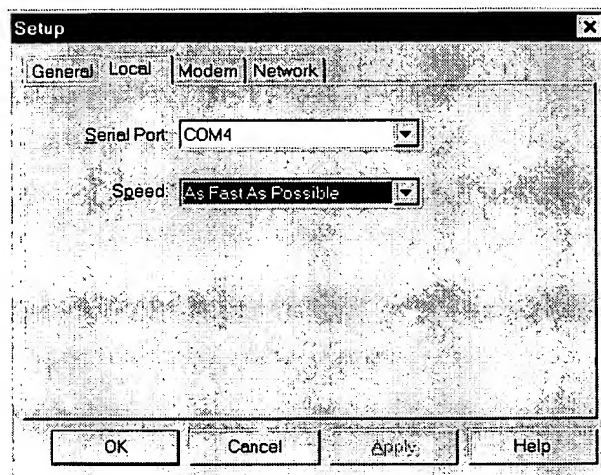
6. Deselect any other check boxes in the Options tab.
7. Click Apply and OK.

Configuring HotSync Manager for infrared communication

Next, you need to go to the HotSync Manager and specify the simulated port used for infrared communication.

To configure HotSync Manager for infrared communication:

1. Click the HotSync Manager icon  in the Windows system tray.
2. Make sure Local is checked on the menu.
3. Choose Setup.
4. Click the Local tab.
5. In the Serial Port drop-down box, select the COM port that was given as the simulated port in the Options tab of the Infrared Monitor (in this example, COM4).



6. Click OK.

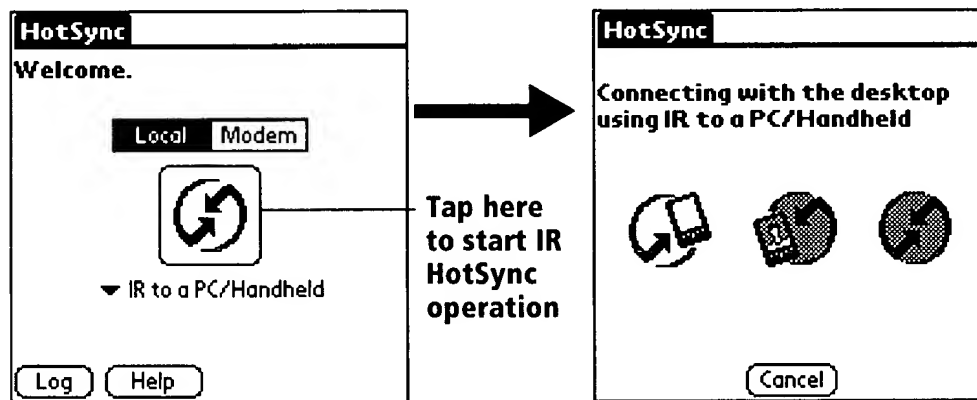
The HotSync Manager is now communicating with the simulated port defined for infrared communication. This means that you cannot use your cradle again until you reconfigure the HotSync Manager to communicate with the port defined for cradle synchronization.

Performing an IR HotSync operation

After you complete the steps to prepare for performing an IR HotSync operation, it is easy to perform the actual operation.

To perform an IR HotSync operation:


1. In the Applications Launcher, tap the HotSync icon.
2. Tap Local.
3. Tap the pick list below the HotSync icon and select IR to a PC/Handheld.
4. Position the IR port of your organizer within a couple of inches of the infrared port of your computer.
5. Tap the HotSync icon to start the IR HotSync operation.



Returning to cradle HotSync operations

It's easy to return to using the cradle for HotSync operations.

To return to cradle HotSync operations:

1. If needed, connect the cradle to a serial (COM) port of your computer.
2. Click the HotSync Manager icon  in the Windows system tray.
3. Choose Setup, and then click Local.
4. Select the COM port where your cradle is connected.
5. Click OK.

Now, the next time you want to perform a HotSync operation, just press the HotSync button on the cradle, as you always did in the past.

You can leave the HotSync application on your organizer set to perform IR HotSync operations and still use the cradle. This is useful if you perform HotSync operations with both your desktop computer and a laptop that you travel with. When you travel, you don't have to carry a cradle or cable because your organizer is set to perform IR HotSync operations. When you're in the office, just place your organizer in the cradle and press the HotSync button.

Conducting a HotSync operation via modem

You can use a modem to synchronize your organizer when you are away from your computer.

Note: The first HotSync operation must be local, using the cradle. After that, you can perform a modem HotSync operation.

To perform a HotSync operation via modem you need the following:

- A modem connected to your computer.
- Palm Desktop software configured for use with the modem.
- A Palm V™ Modem connected to your organizer.
- A configuration for the kind of modem connection (Serial to Modem or IrCOMM to Modem) you want to make. See "Connection preferences" in Chapter 7 for more information.

Preparing your computer

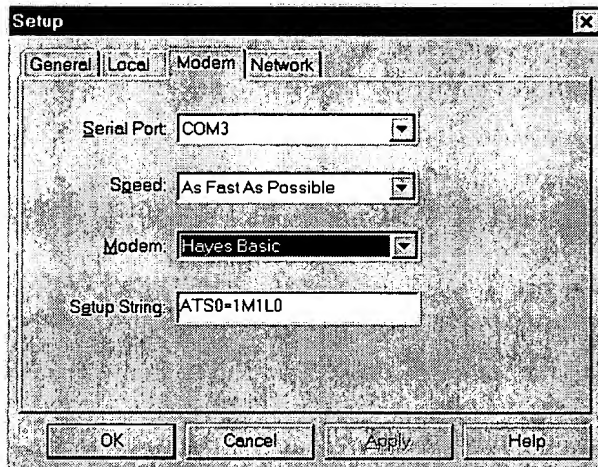
There are a few steps you must perform to prepare your computer for a modem HotSync operation. Be sure to perform these steps before you leave your office so that your computer is ready to receive a call from your organizer.

To prepare your computer for a modem HotSync operation:

1. Confirm that the computer modem is connected and turned on, and that no communications applications, such as fax or telephony software, are running on a COM port.

Note: Make sure the computer is disconnected from all online services, such as America Online (AOL) and CompuServe. This helps to avoid conflicts with the COM port.

2. Start HotSync Manager if it is not already running, and from the HotSync Manager menu, choose Modem.
3. Adjust the following options as needed.

**Serial Port**

Identifies the port for the modem. If you are unsure of the port assignment, look at the Modem Properties in the Windows Control Panel.

Speed

Determines the speed at which data is transferred. Try the As Fast As Possible rate first, and adjust downward if you experience problems. This setting allows Palm Desktop software and your organizer to find and use the fastest speed.

Modem

Identifies the modem type or manufacturer. Refer to your modem manual or face plate for its type or settings. If you're not sure of your modem type or your modem doesn't match any that appear in the list, select Hayes Basic.

Setup String



Identifies the setup string for your particular modem. Not all modems require a setup string. Refer to your modem manual and enter the setup string if recommended by the manufacturer.

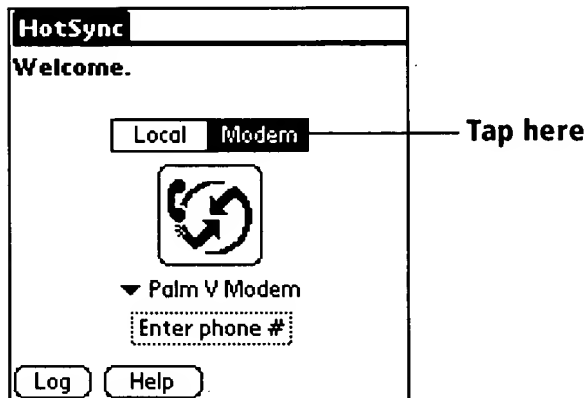
4. Click OK.

Preparing your organizer

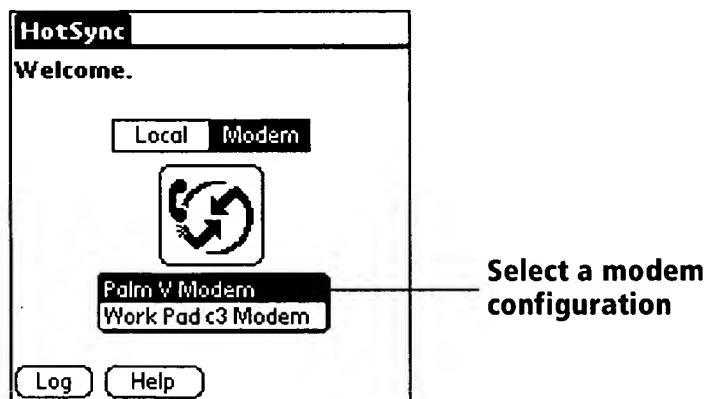
There are a few steps you must perform to prepare your organizer for a modem HotSync operation.

To prepare your organizer for a modem HotSync operation:

1. Tap the Applications icon .
2. Tap the HotSync icon .
3. Tap Modem.

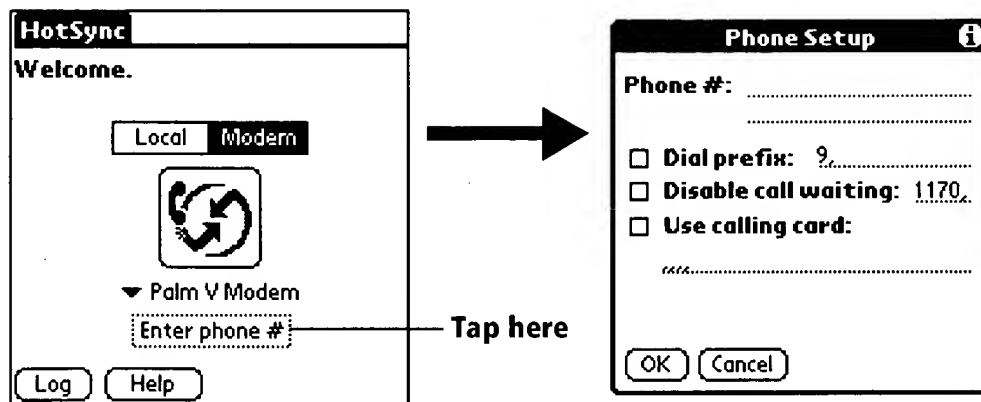


4. Tap the pick list below the icon and select a modem configuration..



Note: If you need to create a configuration, tap the Menu icon and then select Options and Connection Setup. See "Connection preferences" in Chapter 7 for more information.

5. Tap the Enter phone # field.



Note: If you plan to connect to your company's dial-in server (network modem) instead of connecting to a computer modem, see "Conducting a HotSync operation via a network" later in this chapter.

6. Enter the telephone number to access the modem connected to your computer.
7. If needed, enter a dial prefix (such as "9") to access an outside line, and then tap the Dial Prefix check box.




Tip: You can enter a comma in the field to introduce a "pause" in the dialing sequence. Each comma equals a two second pause.

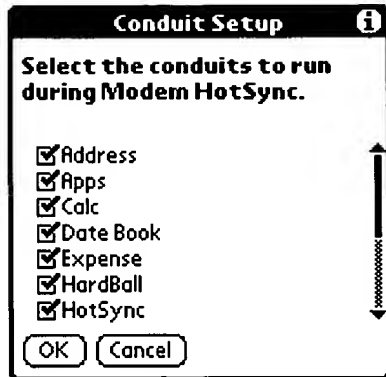
8. If the phone line you're using for the organizer has Call Waiting, select the Disable call waiting check box to avoid an interruption during the modem HotSync operation.
9. If you want to use a calling card to place the call, select the check box and enter the calling card number.
10. Tap OK.

Selecting the conduits for a modem HotSync operation

The Conduit Setup dialog box on your organizer enables you to define which files and/or applications synchronize during a modem HotSync operation. You can use these settings to minimize the time required to synchronize data with a modem.

To change the Conduit Setup for a modem HotSync operation:

1. Tap the Applications icon .
2. Tap the HotSync icon .
3. Tap the Menu icon .
4. Tap Options, and then tap Conduit Setup.
5. Tap the check boxes to deselect the files and applications that you do *not* want to synchronize during a modem HotSync operation. The default setting is to synchronize all files.






Note: Applications that do not have a database (such as games) do not synchronize — even if you select the item in the Conduit Setup dialog box.

6. Tap OK.

Performing a HotSync operation via a modem

After you prepare your computer and your organizer, and select your Conduit Setup options, you are ready to perform a modem HotSync operation.

To perform a modem HotSync operation:

1. Tap the Applications icon .
2. Tap the HotSync icon .
3. Tap the Modem icon  to dial the Palm Desktop modem and synchronize the applications.
4. Wait for the HotSync operation to complete. If you have any problems conducting a successful HotSync operation, see Appendix B.

Conducting a HotSync operation via a network

When you use the network HotSync technology, you can take advantage of the LAN and WAN connectivity available in many office environments. The network HotSync technology enables you to perform a HotSync operation by dialing in to a network or by using a cradle that is connected to any computer on your LAN or WAN (provided that the computer connected to the cradle also has the network HotSync technology installed, your computer is on, and the HotSync Manager is running).


Connecting to your company's dial-in server

A network HotSync operation requires the following (consult your System Administrator for assistance):

- Your computer has TCP/IP support installed.
- Both your company's network system and its remote access server support TCP/IP.
- You have a remote access account.

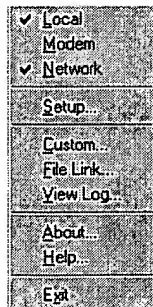
Everything you need to connect to your company's dial-in server (network modem) is included with Palm Desktop software and organizer software. You need to activate the feature, however, on both Palm Desktop software and your organizer.

To prepare your computer for a network HotSync operation:

1. Click the HotSync Manager icon  in the Windows system tray.

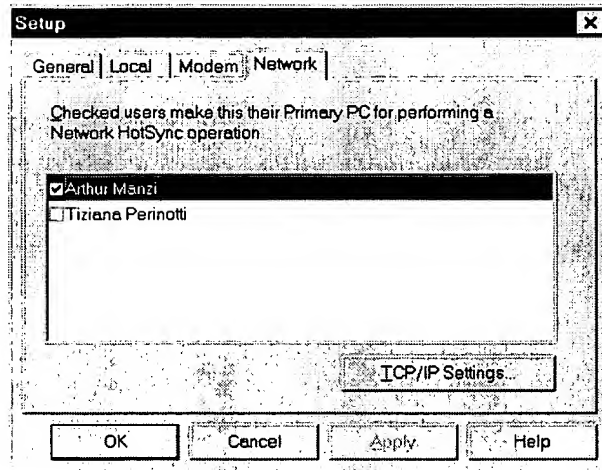
Tip: The Windows system tray is usually in the lower-right corner on your computer display. The location may vary depending on the location of the taskbar and the version of Windows you are using.

2. From the HotSync Manager menu, choose Network.



3. From the HotSync Manager menu, choose Setup.




- Click the Network tab and make sure your user name has a check mark next to it. If the check mark is not there, click the check box next to your user name.

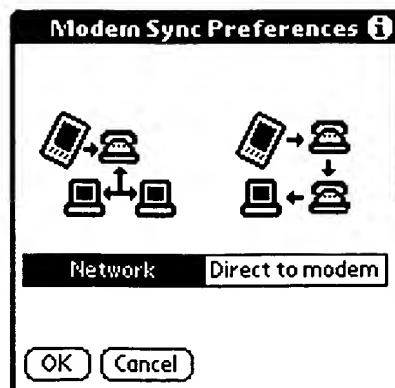


- Click OK.
- Put your organizer in the cradle and perform a HotSync operation.

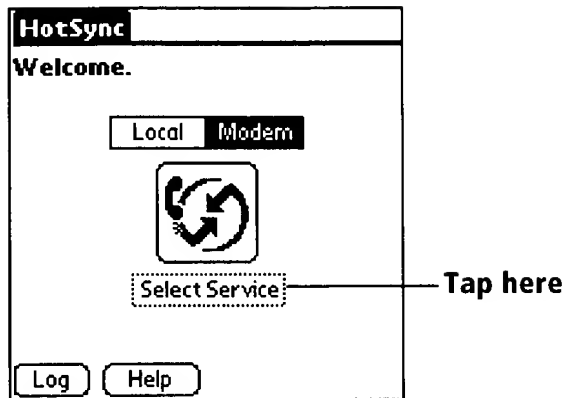
The HotSync operation records network information about your computer on your organizer. With this information, your organizer can locate your computer when you perform a HotSync operation over the network.

To prepare your organizer for a network HotSync operation:

- Tap the Applications icon .
- Tap the HotSync icon .
- Tap the Menu icon .
- Tap Options, then tap Modem Sync Prefs.
- Tap Network.

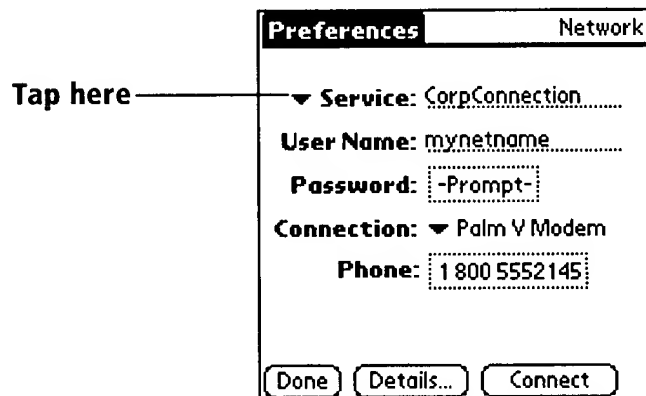



6. Tap OK.
7. Tap Select Service.



Note: See “Network preferences and TCP/IP software” in Chapter 7 for information on creating a network connection.

8. Tap Service and select a service.



9. Tap Done.
10. Tap the Menu icon .
11. Tap Options, then tap Conduit Setup.

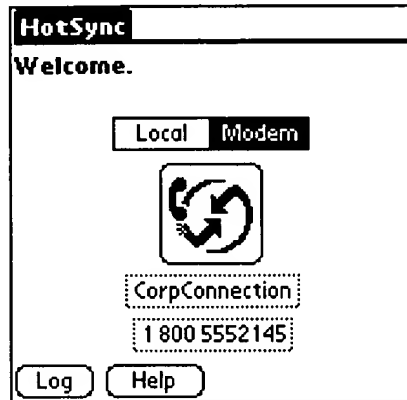
Follow the instructions in “Selecting the conduits for a modem HotSync operation” earlier in this chapter.

Performing a network HotSync operation

After you prepare your computer and your organizer, and select your Conduit Setup options, you are ready to perform a network HotSync operation.

To perform a network Hotsync operation:

- Tap the modem HotSync icon to begin the operation.



Using File Link

The File Link feature enables you to import Address Book and Memo Pad information onto your organizer from a separate external file such as a company phone list. HotSync Manager stores the data in a separate category on your Palm Desktop software and your organizer. You can configure the File Link feature to check for changes to the external file when you perform a HotSync operation.

With File Link, you can import data stored in any of the following formats:

- Comma-separated (*.csv)
- Memo Pad archive (*.mpa)
- Address Book archive (*.aba)
- Text (*.txt)

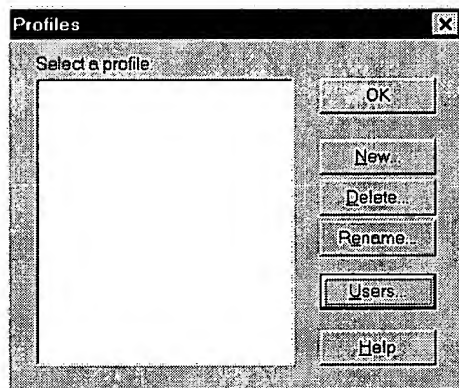
For information on how to set up a file link, see the Palm Desktop online Help.

Creating a user profile

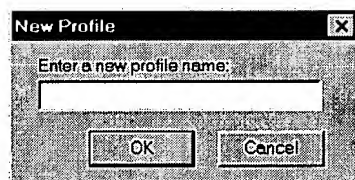
If you use the File Link feature to configure several Palm Computing platform handhelds with specific information (such as a company phone list) before distributing them to their actual users, you can create a user profile to load the data into an organizer without associating that data with a user name. The User Profile feature is designed only for the first-time HotSync operation, before you assign a User ID to a particular organizer.

To create a user profile:

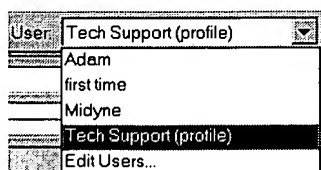
1. Open Palm Desktop software.
2. From the Tools menu, choose Users.
3. Click Profiles.
4. Click New.




5. Enter a unique name for the profile and click OK.

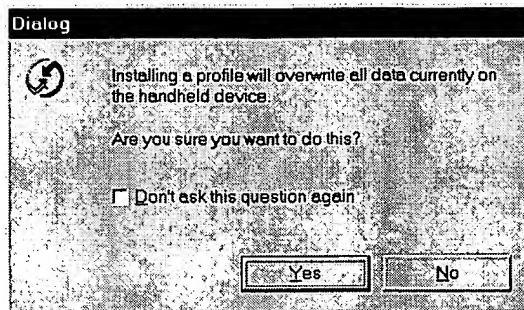


6. Repeat steps 3 and 4 for each profile that you want to create, and then click OK to return to Palm Desktop software.
7. Select the profile from the User list and create the data for the profile (e.g., company phone list, etc.).



To use a profile for the first-time HotSync operation:

1. Place the new organizer in the cradle.
2. Press the HotSync button  on the cradle.
3. Click Profiles.
4. Select the profile you want to load on the organizer, and click OK.



5. Click Yes to transfer all the profile data to the organizer.

The next time you perform a HotSync operation, Palm Desktop software prompts you to assign a user name to the organizer.

Chapter 7

Setting Preferences for Your Organizer



The Preferences screens enable you to customize the configuration options on your Palm V™ organizer.

In the Preferences screens, you can do the following:

General	Set the date and time, the auto shut-off interval, the Stay on in cradle feature, the Beam Receive feature, and the system, alarm, and game sounds.
Formats	Set the country default and the formats for dates, times, calendar, and numbers.
Connection	Configure serial, modem, and infrared communication settings.
Owner	Assign your name, phone number, and other owner information to your organizer.
Buttons	Assign different applications to the buttons on the front panel of your organizer and the HotSync® button on the cradle, and reassign the full-screen pen stroke command.
ShortCuts	Define a list of Graffiti® abbreviations.
Digitizer	Calibrate the screen on your organizer.
Network	Configure your organizer for use with a network.

Viewing preferences

To open the Preferences screens:

1. Tap the Applications icon .
2. Tap the Preferences icon .
3. Tap the pick list in the upper-right corner of the screen.
4. Select the Preferences screen you want to view.

Buttons preferences

The Buttons Preferences screen enables you to associate different applications with the buttons on the front of the organizer.

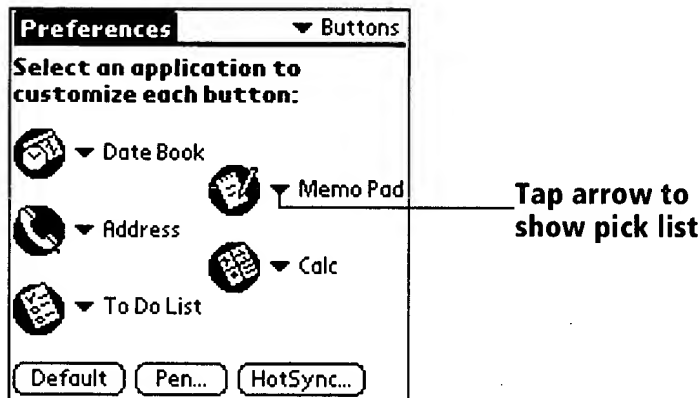
For example, if you find that you seldom use To Do List and often use Expense, you can assign the To Do List button to start Expense.

Any changes you make in the Buttons Preferences screen become effective immediately; you do not have to change to a different screen or application.

If you assign a different application to a button, you can still access the original application using the Applications Launcher.

To change the Buttons preferences:

1. Tap the pick list next to the button you want to re-assign.

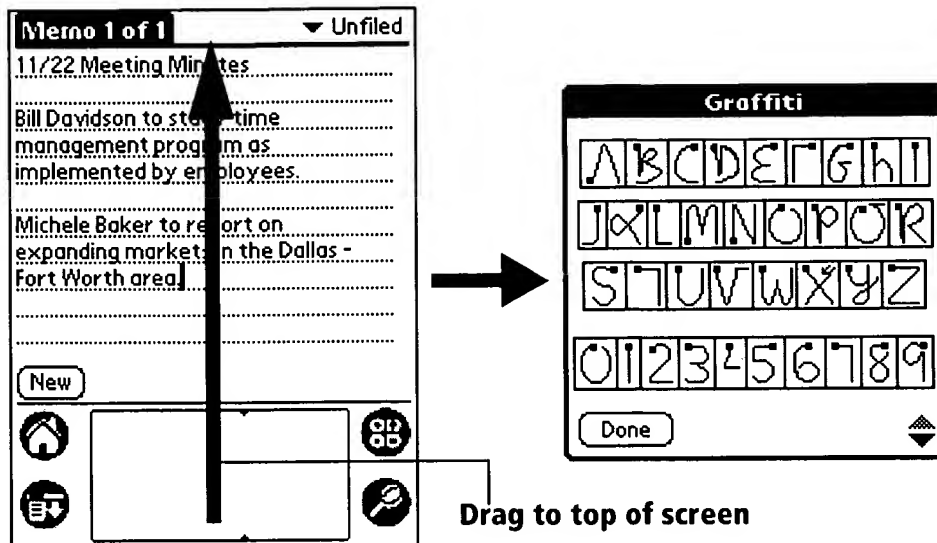


2. Tap the application that you want to assign to the button.

Tip: To restore all of the buttons to their factory settings, tap Default.

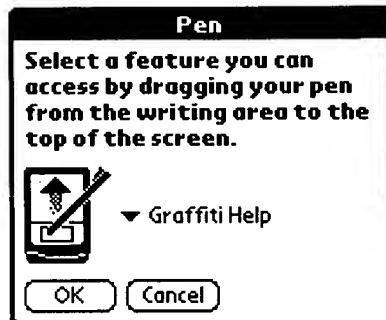
Pen preferences

The Buttons Preferences screen enables you to change the assignment of the full-screen pen stroke. By default, the full-screen pen stroke activates Graffiti Help.



To change the Pen preferences:

1. Tap Pen.



2. Tap the pick list and select one of the following settings for the full-screen pen stroke:

Backlight	Turns on the backlight of your organizer.
Keyboard	Opens the onscreen keyboard for entering text characters.
Graffiti Help	Opens a series of screens that show the complete Graffiti character set.
Turn Off & Lock	Turns off and locks the organizer. You must assign a password to lock the organizer. When locked, you need to enter the password to use your organizer.
Beam Data	Beams the current record to another Palm Computing® platform handheld.

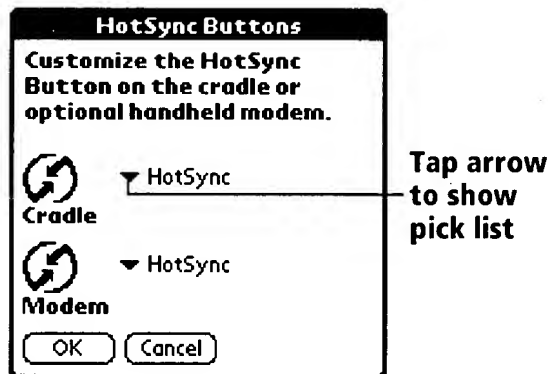
3. Tap OK.

HotSync buttons preferences

The Buttons Preferences screen also enables you to associate different applications with the HotSync button on the cradle and the HotSync button on the optional Palm V™ Modem. Any changes that you make in the HotSync Buttons dialog box become effective immediately; you do not have to change to a different screen or application.

To change the HotSync buttons preferences:

1. Tap HotSync.
2. Tap the pick list next to the button you want to assign.



3. Tap the application that you want to assign to each button.

The default setting for each button is the HotSync setting, which means the cradle and optional Palm V Modem perform their normal HotSync functions.

4. Tap OK.

Digitizer preferences

The Digitizer Preferences screen opens the digitizer calibration screen. This is the same screen that appears when you start your organizer for the first time.

You can recalibrate your screen after a hard reset, or if your digitizer drifts.

Formats preferences

Use the Formats Preferences screen to set the country default and the display format of the dates, times, and numbers on your organizer.

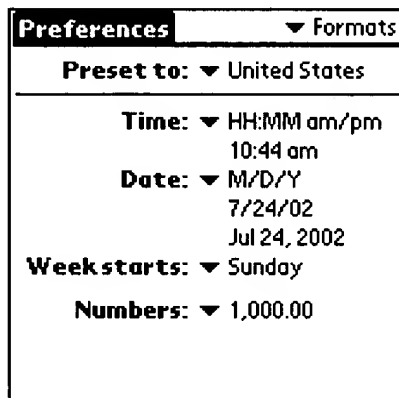
Country default

The country default sets date, time, week start day, and number conventions based on geographic regions where you might use your organizer. For example, in the United Kingdom, time often is expressed using a 24-hour clock. In the United States, on the other hand, time is expressed using a 12-hour clock with an AM or PM suffix.

All your organizer applications use the Country default settings. You can, however, customize your own preferences as described in “Time, date, week start, and numbers formats” later in this chapter.

To set the country default:

1. Tap the country name pick list.



The screenshot shows a 'Preferences' dialog box with a 'Formats' tab. The 'Preset to:' dropdown is set to 'United States'. Below this, there are four settings, each with a dropdown menu and a preview: 'Time' is set to 'HH:MM am/pm' with a preview of '10:44 am'; 'Date' is set to 'M/D/Y' with a preview of '7/24/02' and 'Jul 24, 2002'; 'Week starts' is set to 'Sunday'; and 'Numbers' is set to '1,000.00'.

2. Tap the setting you want to use.

Time, date, week start, and numbers formats

The Time setting defines the format for the time of day. The time format that you select appears in all applications on your organizer.

To select the time, date, week start, and numbers format:

1. Tap the Time pick list and select a format.
2. Tap the Date pick list and select a format.
3. Tap the Week starts pick list, and select whether you want the first day of the week to be Sunday or Monday.

Note: This setting controls the Day, Week, and Month views in Date Book and all other aspects of your organizer that display a calendar.

4. Tap the Numbers pick list, and select formats for the decimal point and thousands separator.

General preferences

The General Preferences screen enables you to set the time, date, auto shutoff interval, and sounds for your organizer.

See Chapter 1 for information on setting the time and date.

Auto-off delay

Your organizer has an automatic shutoff feature that turns off the power and backlight after a period of inactivity. This feature helps conserve battery power in case you forget to turn off your organizer.

If you find that your organizer shuts itself off before you finish reviewing the information on the screen, you should increase the time setting of the automatic shutoff feature.

To set the Auto-off delay:

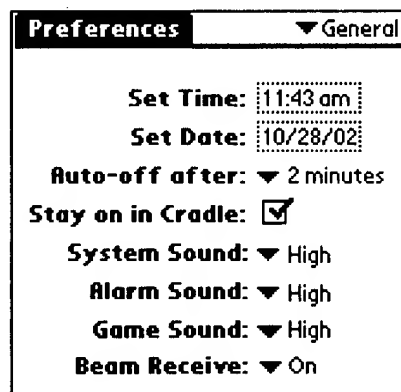
1. Tap the Auto-off pick list.
2. Tap the setting you want to use for the automatic shutoff feature: 1 minute, 2 minutes, or 3 minutes.

Cradle settings

You can choose to leave your organizer on when it is in the cradle during a HotSync operation, or when you are recharging the battery, so you can continue to view your data.

To change the cradle setting:

- Tap the Stay on in Cradle check box to leave your organizer on when it is in the cradle.

A screenshot of the 'Preferences' screen on a handheld device. The screen has a black header bar with 'Preferences' in white text on the left and a dropdown arrow pointing to 'General' on the right. Below the header, the settings are listed: 'Set Time:' followed by a time field showing '11:43 am'; 'Set Date:' followed by a date field showing '10/28/02'; 'Auto-off after:' followed by a dropdown menu showing '2 minutes'; 'Stay on in Cradle:' followed by a checked checkbox; 'System Sound:' followed by a dropdown menu showing 'High'; 'Alarm Sound:' followed by a dropdown menu showing 'High'; 'Game Sound:' followed by a dropdown menu showing 'High'; and 'Beam Receive:' followed by a dropdown menu showing 'On'.

System, alarm, and game sounds

Your organizer uses a variety of sounds. The System, Alarm, and Game Sound settings enable you to turn the sounds on or off, and to adjust the volume level.

To set the system and alarm sounds:

1. Tap the System Sound pick list and select the sound level.

Note: When you turn off the System Sounds, you also turn off the “chime” tones associated with the HotSync operation.

2. Tap the Alarm Sound pick list and select the sound level.
3. Tap the Game Sound pick list and select the sound level.

Note: The Game Sound setting works only with games that are programmed to respond to this setting. Older games typically do not respond to this setting.

Beam Receive

You can choose to turn off the Beam Receive feature. This prohibits anyone from beaming information to your organizer. It also results in a slight saving of battery power.

To change the Beam Receive setting:

- Tap the Beam Receive pick list and select On or Off.

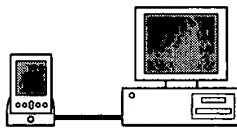
Connection preferences

The Connection Preferences screen enables you to define the settings used to perform different types of HotSync operations. The screen displays a list of available configurations that are ready to be further defined; the list varies depending on the kind of software you've added to your organizer.

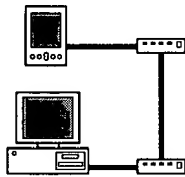
For example, a Palm V Modem connection appears on the list. If you have this modem, you only need to specify the phone setup (and network connection — if required) to complete the configuration.

Note: You can purchase a Palm V Modem for use with your organizer. See <http://www.palm.com>.

You can also create custom configurations. There are four possible kinds of connections.



Serial to PC: A local HotSync connection: the direct serial connection between your organizer and your desktop computer. Your organizer is connected by its serial port to the cradle, and the cradle is attached by its cable to a serial (COM) port of your desktop computer.



Serial to Modem: A connection between a modem attached to the serial port of your organizer and a modem that is part of your computer or laptop.



IrCOMM to PC: A connection between the IR port of your organizer and the infrared device of your computer or laptop.



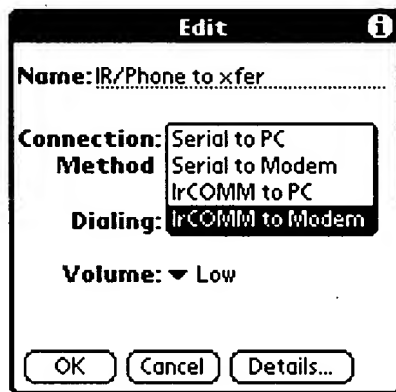
IrCOMM to Modem: A connection between the IR port of your organizer and a modem. The modem can be attached to a computer or some other device containing an IR port.

Sample connection for remote IR HotSync operations

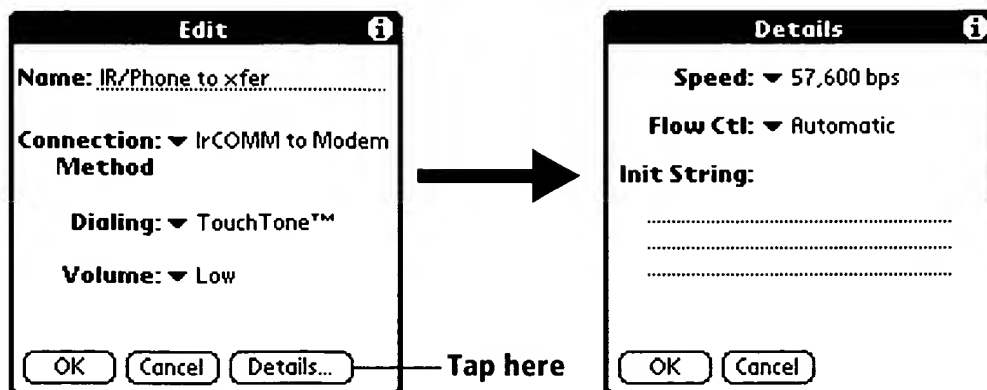
The following sample configuration would enable you to perform an IR HotSync operation by sending data through the IR port of a modem attached to a cell phone, which then dials a modem attached to your desktop computer, to synchronize with your Desktop application. For this example, you use the IrCOMM to Modem connection.

To create an IrCOMM to Modem connection:

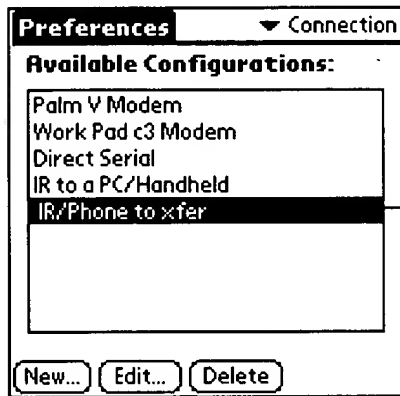
1. Tap New.
2. Enter a name to identify this configuration.
3. Tap the Connection Method pick list and select IrCOMM to Modem.



4. Tap the Dialing pick list and select TouchTone or Rotary.
5. Tap the Volume pick list and select the speaker volume you want to use.
6. Tap Details.



7. Enter the initialization string supplied by the documentation for the modem attached to your cell phone.
8. Tap OK, and then tap OK again to save the configuration.



Your new configuration appears in the list of available configurations

After you create the configuration, you need to set up the HotSync Manager of your Desktop application and the HotSync application of your organizer to perform a modem HotSync operation.

Network preferences and TCP/IP software

The Network Preferences settings enable you to use the TCP/IP software that is included in the organizer operating system. You can use the TCP/IP software to connect with Internet Service Providers (ISPs) or dial-in (remote access) servers. Because the TCP/IP software is a feature of the operating system, you configure all parameters relating to it from the Preferences application.

To use TCP/IP, you must create a configuration in Connection Preferences and then create Network Preferences settings.

Note: The Connection Preferences screen enables you to define several ways that your Palm V organizer can use the Palm V Modem to communicate with remote devices. For example, you can communicate with your ISP server, or with your computer if you are away on travel. See “Connection preferences” earlier in this chapter for a complete explanation on how to create modem configurations.

After you configure both the Connection and Network Preferences, you can establish a PPP (Point-to-Point Protocol), SLIP (Serial Line Internet Protocol), or CSLIP (Compressed Serial Line Internet Protocol) connection with your ISP or dial-in server. You can do this either by using menu commands from the Network Preferences screen or by using a third-party application.

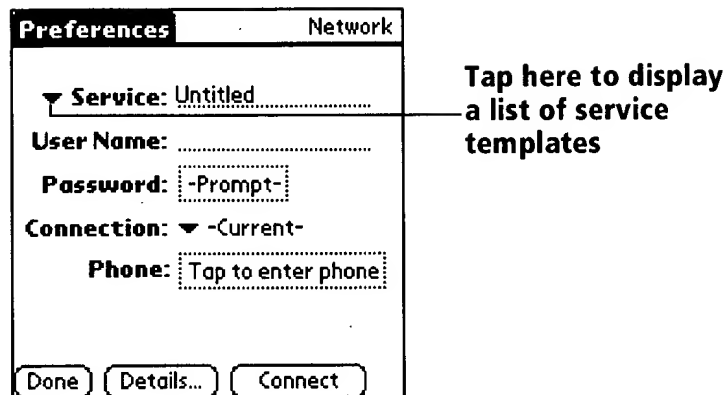
Note: TCP/IP provides the ability to connect to your ISP or dial-in server with applications that allow you to view the transmitted data. Visit the web site <http://www.palm.com> for information on third-party applications that take advantage of TCP/IP.

Selecting a service

Use the Service setting to select the service template for your Internet Service Provider or a dial-in server. Service templates are a set of ISP and dial-in server configuration settings that you can create, save, and reuse.

To select a service:

1. Tap the Service pick list.



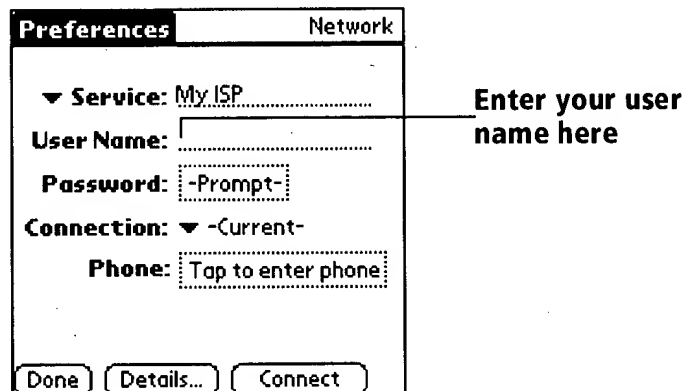
2. Tap the predefined service template you want to use.

Entering a user name

The User Name setting identifies the name you use when you log into your Internet Service Provider or your dial-in server. Although this field can contain multiple lines of text, only two lines appear onscreen.

To enter a user name:

1. Tap the User Name field.
2. Enter your user name.



Note: Most dial-in servers do not accept spaces in the user name.

Entering a password

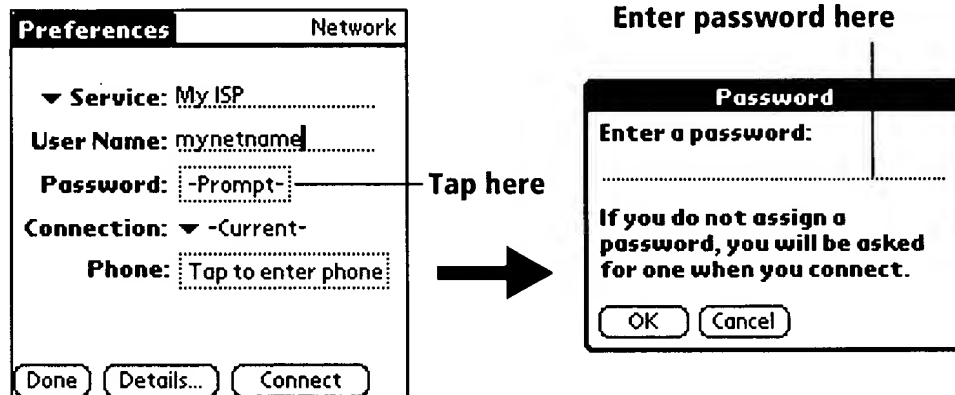
The Password box identifies the password you use to log into your server or ISP. Your entry in this field determines whether your organizer prompts you to enter a password each time you log into your network:

- If you do not enter a password, your organizer displays the word “Prompt” in this field and asks you to enter a password during the login procedure.
- If you enter a password, your organizer displays the word “Assigned” in this field and does not prompt you to enter a password during the login procedure.

Note: If you are concerned about security, select the Prompt option and do not enter a password.

To enter a password:

1. Tap the Password field.
2. Enter the password you use to log into your server.



3. Tap OK.

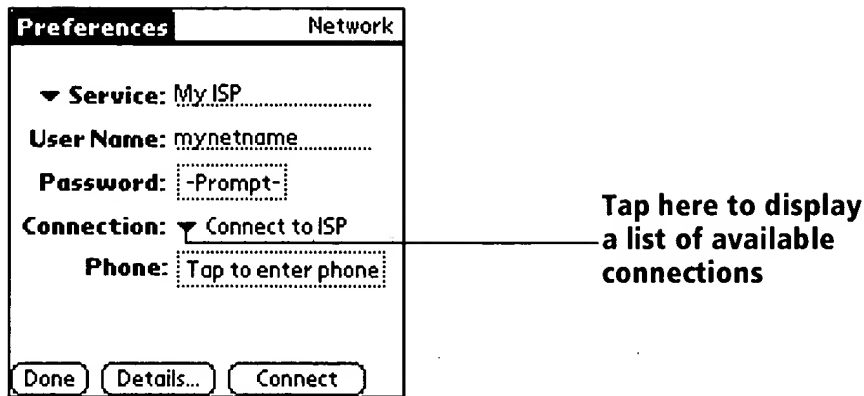
Note: The Password field updates to display the word “Assigned.”

Selecting a connection

Use the Connection setting to select the method you want to use to connect to your Internet Service Provider or a dial-in server. See “Connection preferences” earlier in this chapter for information about creating and configuring connection settings.

To select a connection:

1. Tap the Connection pick list.



2. Tap the connection you want to use.

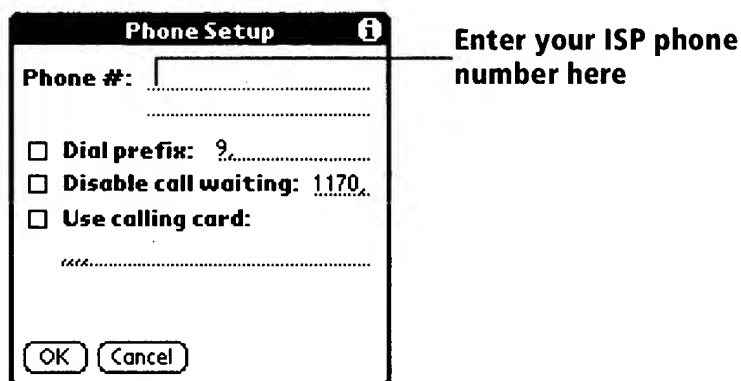
Adding telephone settings

When you select the Phone field, your organizer opens a dialog box in which you define the telephone number you use to connect with your ISP or dial-in server. In addition, you can also define a prefix, disable Call Waiting, and give special instructions for using a calling card.

Note: The Phone Setup dialog box works correctly for AT&T and Sprint long-distance services. However, because MCI works differently, MCI customers need to put the calling card number in the Phone # field and the phone number in the Use calling card field.

To enter your server phone number:

1. Tap the Phone field.
2. Enter the phone number for your ISP or dial-in server.



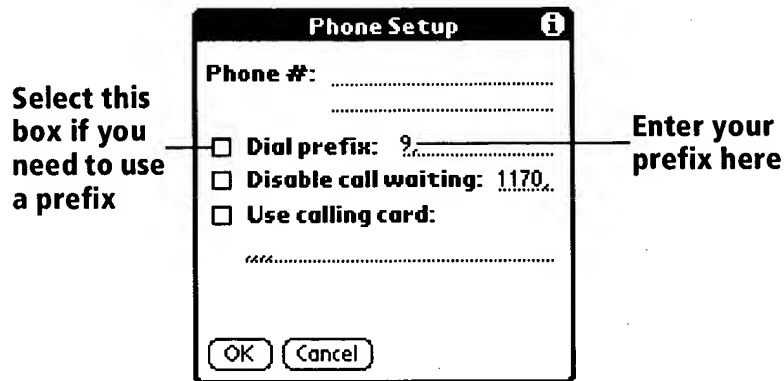
3. If you need to enter a prefix or disable Call Waiting, skip to those procedures. Otherwise, tap OK.

Entering a prefix

A prefix is a number that you dial before the telephone number to access an outside line. For example, many offices require that you dial "9" to dial a number outside the building.

To enter a prefix:

1. Tap the Dial Prefix check box to select it.



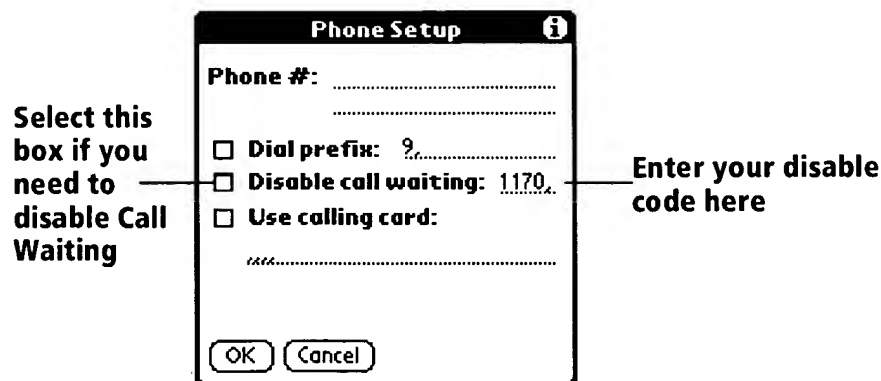
2. Enter the prefix.
3. Tap OK.

Disabling Call Waiting

Call Waiting can cause your session to terminate if you receive a call while you are connected. If your telephone has Call Waiting, you need to disable this feature before logging into your ISP or dial-in server.

To disable Call Waiting:

1. Tap the Disable call waiting check box to select it.



2. Enter the code to disable Call Waiting on the Disable call waiting line.

Note: Each telephone company assigns a code to disable Call Waiting. Contact your local telephone company for the code that is appropriate for you.

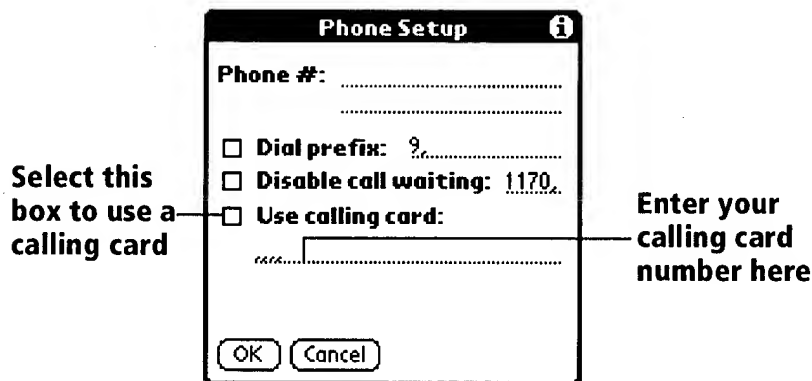
3. Tap OK.

Using a calling card

The Use calling card field enables you to use your calling card when dialing your ISP or Intranet server. Keep in mind that there is usually a delay before you enter your calling card number. When you define your calling card number, you need to add commas at the beginning to compensate for this delay. Each comma delays transmission of your calling card number for two seconds.

To use a calling card:

1. Tap the Use calling card check box to select it.



2. Enter your calling card number on the Use calling card line.

Note: It's a good idea to add at least three commas before your calling card number to compensate for the cue delay.

3. Tap OK.

Connecting to your service

After you set your Connection and Network Preferences, establishing a connection to your Internet Service Provider (ISP) or your company's network (dial-in server) is easy.

Note: If you are connecting to an ISP, you need a third-party application, such as a web browser or news reader, to take advantage of this connection. For information about third-party applications that support TCP/IP, check the web site <http://www.palm.com>.

To establish a connection:

- Tap Connect to dial the current service and display the Service Connection Progress messages.

Tip: To see expanded Service Connection Progress messages, press the lower half of the Scroll button.


To close a connection:

- Tap Disconnect to terminate the connection between your organizer and your service.

Creating additional service templates


You can create additional service templates from scratch or by duplicating existing templates and editing information. After you create a new or duplicate template, you can add and edit settings.

To add a new service template:

1. Tap the Menu icon .
2. Tap Service, and then tap New.

An Untitled service template is added to the Service pick list.

To duplicate an existing service template:

1. Tap the Service pick list.
2. Tap the predefined service template you want to duplicate.
3. Tap the Menu icon .
4. Tap Service, and then tap Duplicate.

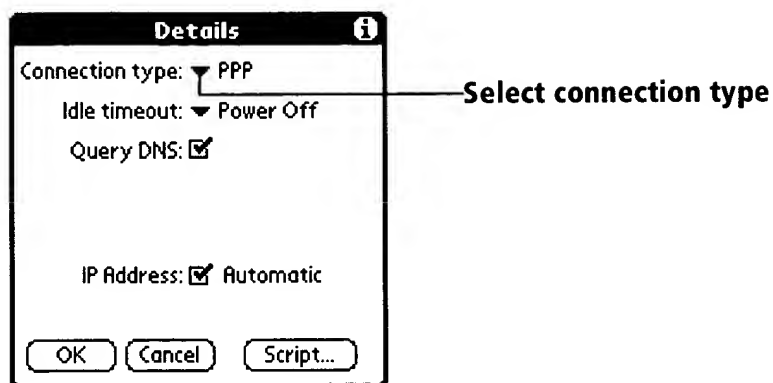
A copy of the service template is added to the Service pick list.

Adding detailed information to a service template

If you are using one of the predefined service templates, you probably only need to enter your user name and telephone number. If you are creating a new service template, you may need to provide additional information to your ISP or dial-in server. You use the Details dialog box to add additional information to a selected service template.

To select a connection type:

1. Tap the service field.
2. Tap Details.



3. Tap the Connection type pick list and select one of the following connection types:

PPP	Point-to-Point protocol
SLIP	Serial Line Internet Protocol
CSLIP	Compressed Serial Line Internet Protocol

Note: If you are not sure, try PPP; if that doesn't work, ask your Internet Service Provider or your System Administrator for the correct connection type.

Idle timeout

The Idle timeout setting defines how long your organizer waits before dropping the connection with your ISP or dial-in server when you switch out of a TCP/IP application.

To set the Idle timeout:

1. Tap the Idle timeout pick list and select one of the following options:

Immediate	Drops the connection to your ISP immediately when you switch to another application.
1 minute	Waits one minute for you to open another application before it drops the connection.
2 minutes	Waits two minutes.
3 minutes	Waits three minutes.

Power Off Keeps your PPP or SLIP connection until you turn off your organizer (or until it times out). This option works best with the Palm V Modem.

2. Tap OK.

Defining primary and secondary DNS

The Domain Naming System (DNS) is a mechanism in the Internet for translating the names of host computers into IP addresses. When you enter a DNS number (or IP address), you are identifying a specific server that handles the translation services.

Each IP address has four sections, separated by periods. In the Details dialog box, you enter each section separately. Each section of an IP address is made up of a number from 0 to 255; numbers are the only allowable characters in this field.

Ask your Internet Service Provider or System Administrator for the correct Primary or Secondary DNS IP numbers.

Tip: Many systems do not require that you enter a DNS. If you are not sure, leave the DNS field blank.

To enter a primary and secondary DNS:

1. Tap the Query DNS check box to deselect it.
2. Tap the space to the left of the first period in the Primary DNS field, and then enter the first section of the IP address.

Note: Each section must be a number from 0 to 255.

3. Repeat step 2 for the second, third, and last sections of the Primary DNS field.
4. Repeat steps 2 and 3 for the Secondary DNS number.
5. Tap OK.

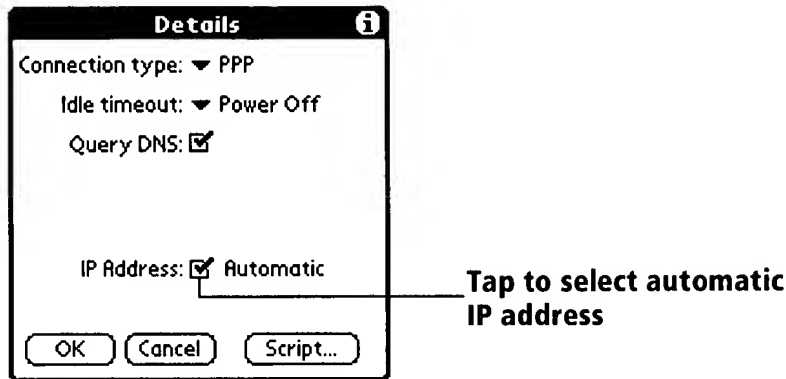
IP address

Everyone who logs on to the Internet needs to have a unique identifier (an IP address), whether permanent or temporary. Some networks dynamically assign a temporary IP address when clients log in. The IP Address field lets you identify whether your network provides automatic (dynamic) temporary IP addressing.

Note: If your IP address is permanently assigned, you need to get that information from your System Administrator. If you are not sure, select Automatic.

To identify dynamic IP addressing:

- Tap the IP Address check box to select it.



To enter a permanent IP address:

1. Tap the IP Address check box to deselect it and display a permanent IP address field below the check box.
2. Tap the space to the left of the first period then enter the first section of the IP address.

Note: Each section must be a number from 0 to 255.

3. Tap and enter the remaining sections of the IP address.
4. Tap OK.

Login scripts

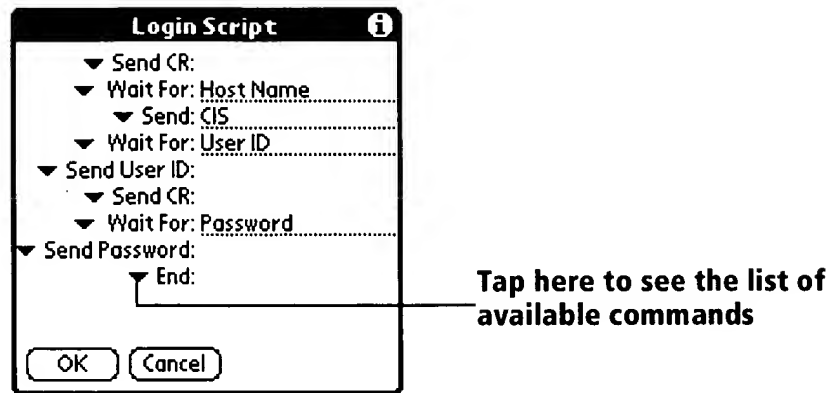
A login script is a series of commands that automates logging in to a network server, for example, your corporate network or your Internet Service Provider (ISP). A login script is associated with a specific service template created in Network Preferences.

A login script is something that you are likely to receive from your IS System Administrator if your company has a system in which you log in to the corporate servers from your organizer using a modem or network connection. The script is generally prepared by the System Administrator and distributed to users who need it. It automates the events that must take place in order to establish a connection between your organizer and the corporate servers.

You can create login scripts in two ways:

- In a text editor on your desktop computer, in which you create a file with the extension .PNC, which you then install on your organizer using the Install Tool (this method is not available to Macintosh users)

- In the Login Script dialog box on your organizer, accessed from the Details dialog box in Network Preferences



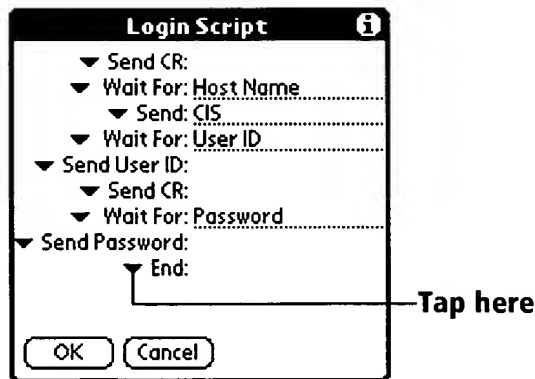
Note: You can also use non-ASCII and literal characters in your login script. See Appendix D for more information.

Creating a login script on your organizer

You can create login scripts by selecting commands from the Command pick list in the Login Script dialog. Some commands, such as Send, require you to supply additional information. Those commands have a parameter field so that you can add the necessary data.

To create a login script:

1. Tap Script.
2. Tap the End pick list.



3. Tap the command you want from the Command list. If the command requires additional information, a field appears to the right of it for you to enter the information. The following commands are available:

Wait For	Tells your organizer to wait for specific characters from the TCP/IP server before executing the next command.
Wait For Prompt	Detects a challenge-response prompt coming from the server and then displays the dynamically generated challenge value. You then enter the challenge value into your token card, which in turn generates a response value for you to enter on your organizer. This command takes two arguments, separated by a vertical bar () on the input line.
Send	Transmits specific characters to the TCP/IP server to which you are connecting.
Send CR	Transmits a carriage return or LF character to the TCP/IP server to which you are connecting.
Send User ID	Transmits the User ID information entered in the User ID field of the Network Preferences screen.
Send Password	Transmits the password entered in the Password field of the Network Preferences screen. If you did not enter a password, this command prompts you to enter one. The Password command is usually followed by a Send CR command.
Delay	Tells your organizer to wait a specific number of seconds before executing the next command in the login script.
Get IP	Reads an IP address and uses it as the IP address for your organizer. This command is used with SLIP connections.
Prompt	Opens a dialog box and prompts you to enter text of some kind (for example, a password or a security code).
End	Identifies the last line in the login script.

4. Repeat steps 2 and 3 until the login script is complete.
5. Tap OK.

Plug-in applications

You can create plug-in applications containing script commands that extend the functionality of the built-in script commands. A plug-in application is a standard .PRC application that you install on your organizer just like any other application. After you install the plug-in application, you can use the new script commands in a login script.

Plug-in applications have the following characteristics:


- Written in C language
- Compiled into a device executable
- Called properly from a login script
- Able to return control to a login script after it terminates
- Created using a development environment that supports the Palm OS™ software, such as Metrowerks Code Warrior

For additional information on creating plug-in applications, send e-mail to Palm Developer Support at devsupp@palm.com.

Deleting a service template

There is only one way to delete a service template: use the Delete command from the Service menu.

To delete a service template:

1. Tap the Service pick list.
2. Tap the service template you want to delete.
3. Tap the Menu icon .
4. Tap Service, and then tap Delete.
5. Tap OK.

Network preferences menu commands

The Network Preferences screen includes menu commands to make it fast and easy to create and edit service templates. TCP/IP application menus are shown here for your reference. See “Using menus” in Chapter 1 for more information about choosing menu commands.

Service menu

Service	Edit	Options
New	✓N	
Delete...	✓D	
Duplicate	✓L	

Options menu



TCP/IP troubleshooting

If you are having a problem establishing a network connection using TCP/IP, check this section and try the suggestions listed.

Displaying expanded Service Connection Progress messages

It's helpful to identify at what point in the login procedure the connection fails. An easy way to do this is to display the expanded Service Connection Progress messages. Expanded Service Connection Progress messages describe the current stage of the login procedure. Press the lower half of the scroll button at any point during login to display these messages.

Viewing the Network Log

If viewing the expanded Service Connection Progress messages does not give you enough information to find out why you cannot connect to your ISP or dial-in server, take a look at the Network Log. The Network Log lists all of the communication that occurs between your modem and your dial-in server during the login procedure. The information in the Network Log can help your ISP or your System Administrator pinpoint where the login procedure communication fails and why.

To view the Network Log:

1. Tap Options, and then tap View Log.
2. Tap the up and down arrows of the scroll bar to see the entire Network Log.
3. Tap Done.

Adding a DNS number

If your ISP or dial-in server requires a DNS number and you did not enter that information in the Network Preferences screen, it will appear that you successfully logged into your network. When you try to use an application or look up information, however, the connection fails. If this occurs, try adding a DNS number. Ask your ISP or your System Administrator for the correct Primary and Secondary DNS IP numbers.

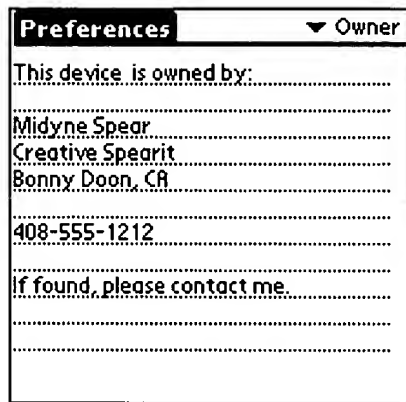
Owner preferences

The Owner Preferences screen enables you to record a name, company name, phone number, or any other information that you want to associate with your organizer.

If you use the Security application to turn off and lock your organizer with a password, information that you put in the Owner Preferences displays the next time you turn on your organizer. See Chapter 1 for more information.

To enter the Owner preferences:

- Enter the text that you want to associate with your organizer in the Owner Preferences screen. If you enter more text than can fit on one screen, a scroll bar automatically appears on the right side of the screen.



The screenshot shows a window titled "Preferences" with a dropdown menu set to "Owner". Below the title bar is a text area with the prompt "This device is owned by:". The text area contains the following text: "Midyne Spear", "Creative Spearit", "Bonny Doon, CA", and "408-555-1212". Below this text is another prompt: "If found, please contact me:". The text area is scrollable, as indicated by the vertical scrollbar on the right side.

If you assign a password with the Security application, the information in the Owner Preferences screen cannot be changed. In this case, an Unlock button appears at the bottom of the screen.

To unlock the Owner Preferences screen:

1. Tap Unlock.
2. Enter the password that you defined in the Security application.
3. Tap OK.

ShortCuts preferences

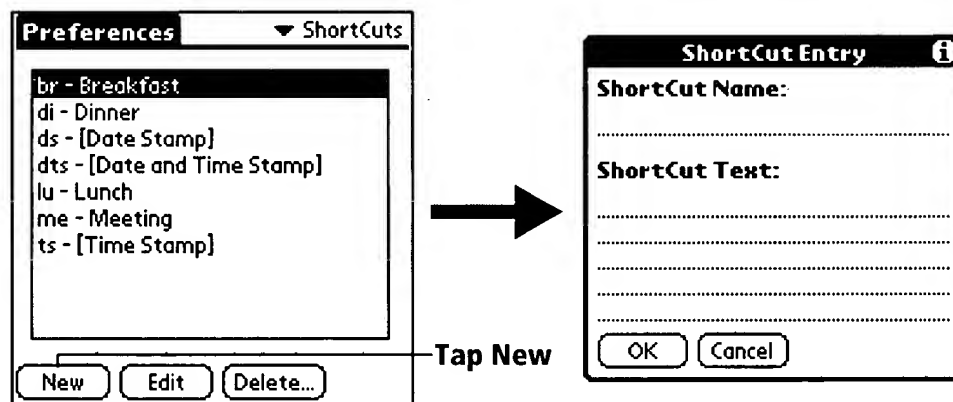
The ShortCuts Preferences screen enables you to define abbreviations for entering text with Graffiti strokes. This section describes how to create, edit, and delete a ShortCut. See Chapter 2 for more information on the use of ShortCuts.

Creating a ShortCut

You can create a ShortCut for any words, letters, or numbers. All ShortCuts you create appear on the list in the ShortCut Preferences screen. All the ShortCuts are available in any of your organizer applications and are backed up on your computer when you perform a HotSync operation.

To create a ShortCut:

1. Tap New.
2. On the ShortCut name line, enter the letters you want to use to activate the ShortCut.




3. Tap the ShortCut Text area and enter the text that you want to appear when you write the ShortCut characters.

Tip: You may want to add a space (space character) after the last word in your ShortCut text. This way, a space automatically follows the ShortCut text.

4. Tap OK.

Tip: To use a ShortCut, draw the ShortCut stroke followed by the ShortCut characters. When you draw the ShortCut stroke, the ShortCut symbol appears at the insertion point to show that you are in ShortCut mode.

ShortCut	
-----------------	---

Editing a ShortCut

After you create a ShortCut, you can modify it at any time.

To edit a ShortCut:

1. Tap the ShortCut you want to edit.
2. Tap Edit.
3. Make the changes you want and tap OK.

Deleting a ShortCut

If you no longer need a ShortCut, you can delete it from the list of ShortCuts.

To delete a ShortCut:

1. Tap the ShortCut you want to delete.
2. Tap Delete.
3. Tap Yes.

Appendix A

Maintaining Your Organizer

This chapter provides information on the following:

- Proper care of your organizer
- Prolonging battery life
- Resetting your organizer

Caring for your organizer

Your organizer is designed to be rugged and reliable and to provide years of trouble-free service. Please observe the following general tips when using your organizer:

- Take care not to scratch the screen of your organizer. Keep the screen clean. When working with your organizer, use the supplied stylus or plastic-tipped pens intended for use with a touch-sensitive screen. Never use an actual pen or pencil or other sharp object on the surface of the organizer screen.
- Your organizer is not waterproof and should not be exposed to rain or moisture. Under extreme conditions, water may enter the circuitry through the front panel buttons. In general, treat your organizer as you would a pocket calculator or other small electronic instrument.
- The touch-sensitive screen of your organizer contains a glass element. Take care not to drop your organizer or subject it to any strong impact. Do not carry your organizer in your back pocket: if you sit on it, the glass may break.
- Protect your organizer from temperature extremes. Do not leave your organizer on the dashboard of a car on a hot day, and keep it away from heaters and other heat sources.
- Do not store or use your organizer in any location that is extremely dusty, damp, or wet.
- Use a soft, damp cloth to clean your organizer. If the surface of the organizer screen becomes soiled, clean it with a soft cloth moistened with a diluted window-cleaning solution.

Battery considerations

Please note the following considerations for the battery in your organizer:

- Under normal conditions, your organizer battery should remain charged by placing it in the cradle for just a few minutes each day. You can conserve battery life by minimizing the use of the backlight feature, and changing the Auto-off setting that automatically turns the organizer off after a period of inactivity. See “General preferences” in Chapter 7 for more information.
- If the battery becomes low in the course of normal use, an alert appears on the organizer screen describing the low battery condition. If this alert appears, perform a HotSync® operation to back up your data; then leave your organizer in the cradle to recharge the unit. This helps prevent accidental data loss.
- If the battery drains to the point where your organizer does not operate, it stores your data safely for about a week. In this case, there is enough residual energy in the battery to store the data, but not enough to turn on your organizer. If your organizer does not turn on when you press the power button, you should recharge the unit immediately.
- If your battery drains and you have the unit in an uncharged state for an extended period of time, you can lose all of the stored data.
- There are no serviceable parts inside your organizer, so do not attempt to open the unit. You never need to replace the battery, even if the charge runs out.
- If you ever dispose of your Palm V™ organizer, please dispose of it without damaging the environment. Either return your organizer to 3Com, or take it to your nearest environmental recycling center.

Resetting your organizer

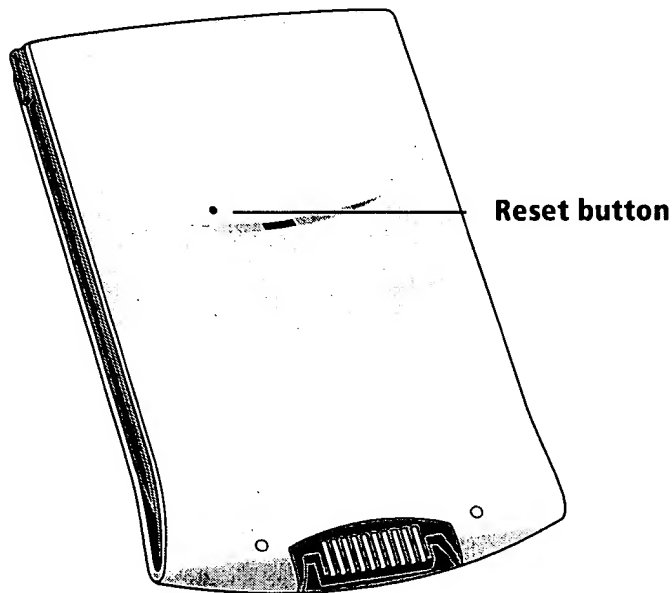
Under normal circumstances, you will not have to use the reset button. On rare occasions, however, your organizer may no longer respond to buttons or the screen. In this case, you need to perform a reset to get your organizer running again.

Performing a soft reset

A soft reset tells your organizer to stop what it's doing and start over again. All records and entries stored in your organizer are retained with a soft reset. After a soft reset, the Welcome screen appears, followed by the General Preferences screen (to set time and date).

To perform a soft reset:

- Use the reset tip tool, or the tip of an unfolded paper clip (or similar object *without* a sharp tip), to gently press the reset button inside the hole on the back panel of your organizer.



Tip: The metal and plastic stylus that comes with your organizer has a reset tip inside. To use it, unscrew the metal barrel from the stylus quill.

Performing a hard reset

With a hard reset, all records and entries stored in your organizer are erased. Never perform a hard reset unless a soft reset does not solve your problem.

Note: You can restore any data previously synchronized with your computer during the next HotSync operation.

To perform a hard reset:


1. Hold down the power button on the front panel of the organizer.
2. While holding down the power button, use the reset tip tool, or the tip of an unfolded paper clip (or similar object *without* a sharp tip) to gently press and release the reset button.
3. Wait for the Palm Computing® Platform logo to appear; then release the power button.
4. When a message appears on the organizer screen warning that you are about to erase all the data stored on your organizer, do one of the following:

Press the upper half of the scroll button on the front panel of the organizer to complete the hard reset and display the Digitizer screen.

Press any other button to perform a soft reset.

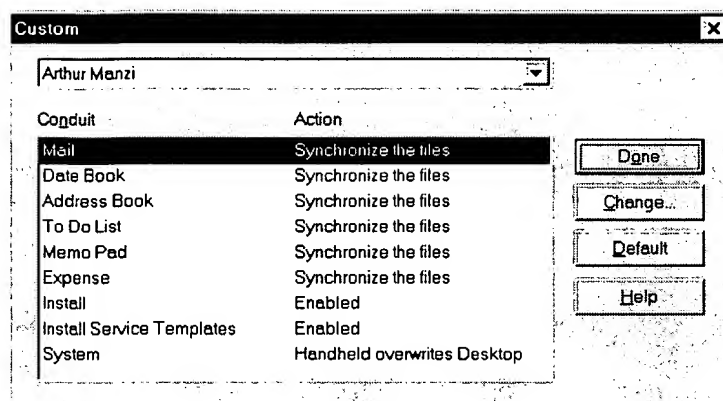
Note: With a hard reset, the current date and time are retained. Formats Preferences and other settings are restored to their factory default settings.

To restore your data after a hard reset:

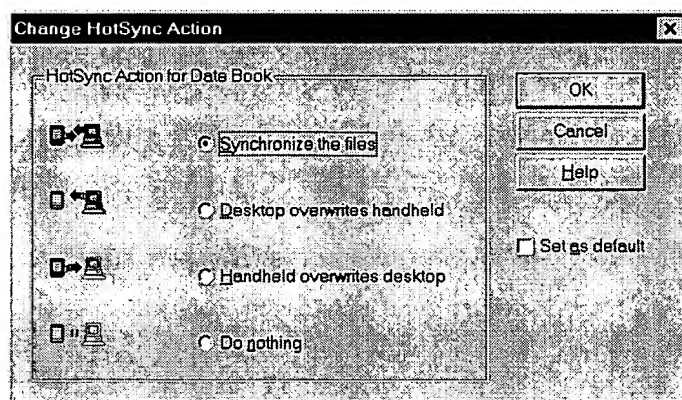
1. Click the HotSync icon ™ in the Windows system tray (bottom-right corner of the taskbar).

Tip: You can also click the HotSync command on the Palm Desktop software menu bar.

2. From the HotSync Manager menu, choose Custom.



3. Select the appropriate user name from the list.
4. Select an application in the Conduit list.
5. Click Change.



6. Select Desktop overwrites handheld.

Note: Changing the HotSync setting from the default affects only the *next* HotSync operation. Thereafter, the HotSync Actions revert to their default settings. To use a new setting on an ongoing basis, select the Set As Default box. Thereafter, whatever you selected as the default setting is used when you click the Default button in the Custom dialog.

7. Click OK.
8. Repeat steps 4 through 7 to change conduit settings for other applications.
9. Click Done to activate your settings.
10. Perform a HotSync operation.

Appendix B

Frequently Asked Questions

If you encounter a problem with your Palm V™ organizer, do not call Technical Support until you have reviewed the following list of frequently asked questions, and you have also reviewed the following:

- The README file and HelpNotes located in the folder where you installed the Palm™ Desktop software on your computer (or on your installation CD or diskettes)
- The Palm Desktop online Help
- The most recent Palm V organizer HelpNotes on your regional web site

If you are still having problems, contact Technical Support. For US and International telephone numbers, see the Technical Support card that comes with your organizer.

Note: Thousands of third-party add-on applications have been written for the Palm Computing® platform. Unfortunately, we are not able to support such a large number of third-party applications. *If you are having a problem with a third-party application, please contact the developer or publisher of that software.*

Software installation problems

Problem	Solution
When I install Palm Desktop software I get an error that a modem is attached to my serial port, but there is no modem attached.	Take your organizer out of the cradle and install again.

Operating problems

Problem

Solution

I don't see anything on my organizer's screen.

Try each of these in turn:

- Press the contrast control button and adjust the contrast.
- Recharge the unit. If your organizer still does not operate, try a soft reset. See "Resetting your organizer" in Appendix A.

I get a warning message telling me my organizer memory is full.

- Purge Date Book and To Do List. This deletes To Do List items and past Date Book events from the memory of your organizer. See "Purging records" in Chapter 4. You may need to perform a HotSync® operation to recover the memory.
- Delete unused memos and records. If necessary, you can save these records. See "Deleting records" in Chapter 4.
- If you have installed additional applications on your organizer, remove them to recover memory. See "Removing applications" in Chapter 3.

My organizer keeps turning itself off.

Your organizer is designed to turn itself off after a period of inactivity. This period can be set at one, two, or three minutes. Check the Auto-off setting. See "General preferences" in Chapter 7.

My organizer is not making any sounds.

Check the System Sound setting. See "General preferences" in Chapter 7.

My organizer has frozen.

Perform a soft reset. See "Resetting your organizer" in Appendix A.


Tapping and writing problems

Problem

Solution

When I tap the buttons or screen icons, my organizer activates the wrong feature.

Calibrate the screen. See “Digitizer preferences” in Chapter 7.

When I tap the Menu icon , nothing happens.

Not all applications or screens have menus. Try changing to a different application.

I can’t get my organizer to recognize my handwriting.

- For your organizer to recognize handwriting input with the stylus, you need to use Graffiti® writing. See “Using Graffiti writing to enter data” in Chapter 2.
- Make the Graffiti character strokes in the Graffiti writing area, not on the display part of the screen.
- Write Graffiti strokes for letters in the left-hand side, and the strokes for numbers in the right-hand side of the Graffiti writing area.
- Make sure that Graffiti is not shifted into extended or punctuation modes. See “Using Graffiti writing to enter data” in Chapter 2.
- See “Graffiti tips” in Chapter 2 for tips on increasing your accuracy when you write Graffiti characters.

Application problems

Problem

Solution

I tapped the Today button, but it does not show the correct date.

Your organizer is not set to the current date. Make sure the Set Date box in the General Preferences screen displays the current date. See "General preferences" in Chapter 7 for more information.

I know I entered some records, but they do not appear in the application.

- Check the Categories pick list (upper-right corner). Choose All to display all of the records for the application.
- Check Security and confirm that Private Records is set to Show private records.
- In To Do List, tap Show and see if Show Only Due Items is selected.

I am having problems listing memos the way I want to see them.

- If you cannot manually arrange the order of the memos in the List screen, check the Memo Preferences setting. Make sure that Sort by is set to Manual.
- If you choose to view your memos alphabetically on Palm Desktop software and then perform a HotSync operation, the memos on your organizer still appear in the order defined in the Memo Preferences setting. In other words, the sort settings you use with Palm Desktop software *are not* transferred to your organizer.

I created an event in Date Book, but it doesn't appear in the Week View.

In the Week View, you cannot select overlapping events that have the same start time. If you have two or more events with the same start time, choose the Day View to see the overlapping events.

I entered the euro symbol, but after a HotSync operation it doesn't appear in my desktop software.

You must have fonts that include the euro symbol on your desktop computer. Check these web sites for additional information:

<http://www.microsoft.com/windows/euro.asp>

<http://til.info.apple.com/techinfo.nsf/artnum/n22222>

HotSync problems

Problem

Solution

I cannot do a HotSync operation; what should I check to make sure I am doing it correctly?

- Check the Windows system tray to make sure the HotSync Manager is running. If it is not, open Palm Desktop software.
- Click the HotSync Manager, choose Setup and click the Local tab. Check that the Serial Port setting displays the correct COM port where your cradle is attached.
- Make sure the cradle is connected securely.

I did a HotSync operation, but one of my applications did not synchronize.

- Click the HotSync Manager and choose Custom. Check that the correct conduit is active.

I am using Outlook as my PIM, but I cannot do a HotSync operation.

- Click the HotSync Manager and choose Custom. Check that the correct conduit is active.
- Check that the correct conduit is installed. Reinstall the HotSync Manager and make sure the correct conduit is selected.

I cannot launch the HotSync Manager.

- Make sure you are not running another program, such as America Online, CompuServe, or WinFax, that uses the serial port you selected in the Setup dialog box.
- Reinstall the Palm Desktop software.

I tried to do a local HotSync operation, but it did not complete successfully.

Try each of these in turn:

- Make sure HotSync Manager is running. If HotSync Manager is running, exit, and restart it.
- Make sure you selected Local from the HotSync Manager menu or the Palm Desktop software menu.
- Check the cable connection between the cradle and the serial port on your computer.
- Make sure you selected the correct serial port on the Local tab in the Setup dialog. It should be set to the port where you connected the cradle.
- Try a lower baud rate setting on the Local tab in the Setup dialog.
- Make sure you are not running another program, such as America Online, CompuServe, or WinFax, that uses the serial port you selected in the Setup dialog box.
- Read the HotSync Log for the user account for which you are performing a HotSync operation.
- Make sure your organizer is seated in the cradle correctly.
- Make sure the gold-plated connectors on the cradle and your organizer are clean. Use a pencil eraser to clean them.

I tried to do a modem HotSync operation, but it did not complete successfully.

Check the following on your computer:

- Make sure your computer is turned on and that it does not shut down automatically as part of an energy-saving feature.
- Make sure the modem connected to your computer is turned on and is connected to the outgoing phone line.
- Make sure Modem is checked in the HotSync Manager menu.
- Make sure the modem you are using with your organizer has an on-off switch. Your organizer cannot “wake up” a modem that has an auto-off feature.
- Make sure the modem is connected properly to a serial port on your computer and is connected to the incoming phone line.
- Confirm that the Setup String in the Setup dialog box configures your modem correctly. You may need to select a different Modem Type or enter a custom Setup String. Most modems have a Setup String that causes them to send initial connection sounds to a speaker. You can use these sounds to check the modem connection.
- Confirm that the Speed setting in the Setup dialog box works for your modem.
- If you have problems using the As Fast As Possible option or a specific speed, try using a slower speed.
- Make sure you are not running another program, such as WinFax, CompuServe, or America Online that uses the serial port you selected in the Setup dialog box.
- Make sure your modem resets before you try again. (Turn off your modem, wait a minute, then turn it back on.)

I tried to do a modem HotSync operation, but it did not complete successfully.
(continued)

Check the following on your organizer:

- Confirm that the telephone cable is securely attached to your modem.
- Make sure the dialing instruction dials the correct phone number.
- If you need to dial an outside line prefix, make sure you selected the Dial Prefix option on your organizer and entered the correct code.
- If the telephone line you are using has Call Waiting, make sure you selected the Disable call waiting option under Modem Sync Phone Setup on your organizer and entered the correct code.
- Make sure the telephone line you are using is not noisy, which can interrupt communications.
- Check the batteries in your modem and replace them if necessary.

I can't perform an IR HotSync operation.

- Be sure the HotSync Manager is running and the Serial Port for local operations is set to the simulated port for infrared communication.
- On your organizer, be sure the HotSync application is set to Local, with the option IR to a PC/Handheld.
- Be sure the IR port of your organizer is aligned directly opposite to, and within a few inches of, the infrared device of your computer.
- IR HotSync operations do not work after you receive a low battery warning. Check the battery power of your organizer. Recharge the internal battery.

My organizer appears to freeze when I place it near my computer.

Move your organizer away from the computer's infrared port.

My organizer displays the message "Waiting for sender" when it's near my computer's infrared port.

- Your computer's infrared port may be set to search automatically for the presence of other infrared devices. Do the following to turn off this option:
 1. In the Windows taskbar, click Start.
 2. Choose Settings, and then choose Control Panel.
 3. Double-click Infrared.
 4. Click the Options tab.
 5. Deselect the option Search for and provide status for devices in range.
 6. Click Apply and OK.
- If you are using Windows 98, move your organizer away from the computer's infrared port.

Beaming problems

Problem	Solution
I cannot beam data to another Palm Computing platform handheld.	<ul style="list-style-type: none">■ Confirm that your organizer and the other Palm V organizer are between ten centimeters (approximately 4") and one meter (approximately 39") apart, and that the path between the two handhelds is clear of obstacles. Beaming distance to other Palm Computing platform handhelds may be different.■ Move your organizer closer to the receiving handheld.
When someone beams data to my organizer, I get a message telling me it is out of memory.	<ul style="list-style-type: none">■ Your organizer requires at least twice the amount of memory available as the data you are receiving. For example, if you are receiving a 30K application, you must have at least 60K free.■ Perform a soft reset. See "Performing a soft reset" in Appendix A for more information.

Recharging problems

Problem	Solution
When I place my Palm V organizer in the cradle, the cradle light does not go on.	<ul style="list-style-type: none">■ Confirm that your organizer is well seated in the cradle.■ Confirm that your recharger cable is properly connected to the back of the cradle's serial (COM) port connector that plugs into your computer.■ Confirm that your recharger is plugged into an AC outlet that has power.

Password problems

Problem

I forgot the password, and my organizer is not locked.

Solution

You can use Security to delete the password, but your organizer deletes all entries marked as private. However, if you perform a HotSync operation *before* you delete the password: the HotSync process backs up all entries, whether or not they are marked private. Then, you can follow these steps to restore your private entries:

1. Use the Palm Desktop software and the cradle or infrared communication to synchronize your data.
2. Tap Forgotten Password in Security to remove the password and delete all private records.
3. Perform a HotSync operation to synchronize your data and restore the private records by transferring them from your computer to your organizer.

I forgot the password and my organizer is locked.

- If you assign a password and lock your organizer, you must perform a hard reset to continue using your organizer. See "Performing a hard reset" in Appendix A for more information.



Technical support

If, after reviewing the sources listed at the beginning of this appendix, you cannot solve your problem, contact your regional technical support office by e-mail, phone, or fax.

Before requesting support, please experiment a bit to reproduce and isolate the problem. When you do contact support, please be ready to provide the following information:

- The name and version of the operating system you are using
- The actual error message or state you are experiencing
- The steps you take to reproduce the problem
- The version of organizer software you are using and available memory

To find version and memory information:

1. Tap the Applications icon .
2. Tap the Menu icon .
3. Tap App, and then tap Info.

Note: Thousands of third-party add-on applications have been written for the Palm Computing platform. Unfortunately, we are not able to support such a large number of third-party applications. *If you are having a problem with a third-party application, please contact the developer or publisher of that software.*

4. Tap Version to see version numbers, and tap Size to see the amount of free memory in kilobytes.

Appendix C

Creating a Custom Expense Report

This section explains how to modify existing Expense application templates and how to create your own custom expense report templates for use with the Expense application.

Note: This section assumes that you are familiar with Microsoft Excel or a similar spreadsheet application. If you are not familiar with Microsoft Excel, consult your company's Information Services department or another experienced user.

About mapping tables

Before creating or modifying an Expense template, it's important to understand the function of the Palm™ Desktop software Expense application. In simple terms, the Expense application is designed to move Expense data from your Palm V™ organizer into a Microsoft Excel spreadsheet. Each Expense item stored in your organizer represents a group of related data. You can associate the following data with an expense item:

- | | |
|------------------|--------------------|
| ■ Category | ■ Payment Currency |
| ■ Date | ■ Vendor |
| ■ Expense Type | ■ City |
| ■ Amount | ■ Attendees |
| ■ Payment Method | ■ Note |

When you perform a HotSync® operation between your organizer and Palm Desktop software on your computer, the Expense data is stored on your computer (in a file named Expense.txt). When you open the Expense application in Palm Desktop software, an Excel macro starts, and populates an expense template with your data based on the rules specified in a spreadsheet file named Maptable.xls.

The Maptable.xls file is an editable spreadsheet that functions as a "mapping table." The function of the mapping table is to guide the Excel macro in extracting the Expense data. The mapping table tells the Excel macro how large the spreadsheet is and provides the data-cell layout of the Excel template used for the Expense Report.

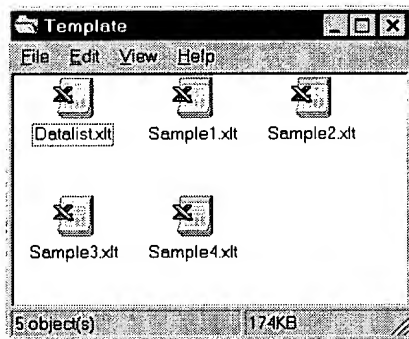
Customizing existing sample templates

Four sample Expense Report templates come with Palm Desktop software. These templates are stored in the Template folder (which is in the same folder as the Palm Desktop software application).

If the layout of one (or more) of these templates is appropriate for your reporting needs, you can easily customize the templates with your company name and other information.

To customize a sample Expense Report template:

1. Make a backup copy of the contents of the Template folder.



2. Double-click the name of the sample template you want to modify to open it in Microsoft Excel.
3. Make any changes that you want to the names (or other information) in the sample template.

Important: Do not insert rows or columns in the sample template. Doing so changes the way your Expense data maps to the template and causes errors. If you want to move the cells to a different location or add or delete rows or columns, you have to make changes to the Maptable.xls file.

Note: You can insert your own company logo without changing the Maptable.xls file. If you change the file name, however, you need to make a corresponding change in the Maptable.xls file.

You can also rename cells without changing the Maptable.xls file, provided that the expense type corresponds to your organizer data. For example, you can change "Snack" to "Munchies," and then all items entered on your organizer as "Snack" map to the cell(s) labeled "Munchies."

4. From the File menu, choose Save As.
5. Click the Save as type drop-down list and choose Template (*.xlt).
6. Navigate to the Template folder (in the Palm Desktop software directory).

Note: If you *do not* need to change the Maptable.xls file, save the template file with its *original file name* (e.g., Sample2.xlt).

If you *do* need to change the Maptable.xls file, give your modified template a unique name. Be sure to use the .xlt file suffix, which defines the file as a Microsoft Excel template.

7. Click Save to save your modified template and make it available for future use.

Note: If you need to modify the Maptable.xls file, you must do this before you can use the modified template with your Expense data. To modify the Maptable.xls file for your new template, see “Programming the mapping table” later in this appendix. *Read all of the sections of this appendix before making changes to the Maptable.xls file.*

Determining the layout of the Expense Report

This section describes the layout considerations for the Expense Report and explains the terms used for creating the report.

Labels

There are two kinds of labels that you need to define for your report: day/date and expense type. Each kind of label can be either Fixed or Variable. A Fixed label means that the label *always* appears as a header at the beginning of a row or column. If a label is not Fixed, it is variable.

For example, a list table of expenses could have variable labels in the rows for day/date, and variable labels in the columns for expense type. In this case, neither day/date or expense type information would be “fixed” (as a header). Instead, the date and expense type information would be filled into the cells of the spreadsheet as appropriate.

Examples of both Fixed and Variable labels appear in the sample expense templates.

A Section is an area of the report that has common formatting. It is common for an Expense report to have more than one Section. For example, the following sample Expense Report named Sample3.xlt contains several Sections.

Section 1
(not prepaid)

Section 2
(prepaid)

If a section contains cells for prepaid (company paid) expenses, you need to create an additional line in the mapping table for "prepaid." This will count as an additional section in the mapping table. The only data that differs in the prepaid section (from the non-prepaid section) is the row/column numbers for the expense type.

Analyzing your custom Expense Report

If you already have a custom Excel expense report, you can use it with a modified mapping table. However, before you can create a Maptable.xls file that corresponds to your custom Expense Report, you must first analyze the characteristics of your report.

Perform the following before you begin a custom mapping table:

- Print a copy of your custom expense report. Activate the Row and Column Headings option in the Sheet settings of the Page Setup command. This enables you to quickly determine the size of the Section(s), as well as the numbers for the start rows and columns.
- On the printed copy, identify the data Sections. A Section is an area of data with common row and column formatting. A yellow highlighter marking pen can make it easy to see the Sections as you work with programming the mapping table. Your custom Expense Report can contain any number of Sections, and the same data can be repeated in any Section.
- On the printed copy, identify the type of Labels that apply to each Section. Each Section can have only one kind of Fixed or Variable Label for rows. Likewise, each Section can have only one kind of Fixed or Variable Label for columns.
- Place a copy of your custom Expense Report in the Template folder (in the Palm Desktop software directory). Change the file name so it has the file extension .xlt (which defines it as a Microsoft Excel template). Make a note of the exact file name so it can be defined in the mapping table file.

Programming the mapping table

Once you have analyzed the components of your custom Expense Report, you can program the mapping table to fill the report with data from the organizer.

To program a new custom mapping table:

1. Open a copy of the Maptable.xls file in Microsoft Excel.

Note: This file is located in the same folder as the Palm Desktop software application. *Make a backup copy of this file before you make your modifications.*

2. **Mapping a new template.** Scroll to where you find the name of the original template that you chose for your modifications. The name of the template will appear in column B of the Maptable.xls file, next to the cell highlighted in green that reads "Template Name:". If you did not modify an existing template, move to any table in the Maptable.xls file.
3. Select all the *rows* associated with the template name. To select the rows, click and drag on the row numbers (left side), so they appear highlighted.

	1	2	3	4	5
5	Template Name:	SAMPLE1.XLT			
6		ROW			
7		Fixed Label		Variable Label by	
8		Day/Date	Expense Type	Day/Date	Expense Type
9	Section1			X	
10					
11					
12					
13	Template Name:	SAMPLE2.XLT			
14		ROW			
15		Fixed Label		Variable Label by	
16		Day/Date	Expense Type	Day/Date	Expense Type
17	Main		X		
18	Business&Entertainment			X	
19					
20					
21					
22	Template Name:	SAMPLE3.XLT			
23		ROW			
24		Fixed Label		Variable Label by	
25		Day/Date	Expense Type	Day/Date	Expense Type
26	Main(PREPAID)		X		
27	Main		X		
MapTable / Criteria /					
Ready Sum=1144					

All rows related to template are selected

4. From the Edit menu, choose Copy.

5. Scroll down to a blank area of the Maptable.xls file (below the rows used for Sample4.xlt), and click on a row number to select a blank row.
6. From the Edit menu, choose Paste. A copy of the rows you selected in step 3 is pasted into the Maptable.xls file.
7. **Name the table.** In the cell immediately to the right of the cell entitled Template Name, enter the *exact* file name of your custom Expense Report template.
8. **Define the number of Sections.** Each row in a table defines how your organizer data will be placed in a Section of your custom Expense Report. Note that the prepaid portion of a section has its own row and counts as a separate section for map table purposes, *even though it is not a separate section in your template.*

22	Template Name:	SAMPLE3.XLT	
23			ROW
24			Fixed Label
25		Day/Date	Expense Type
26	Main (PREPAID)		X
27	Main		X
28	Business Meals &	Entertainment	
29	Mileage/Log		

**Table with
four sections**

You may add or delete rows as necessary so that the total number of rows corresponds to the number of Sections in your custom Expense Report. To clear all of the existing settings in a row, click to select the row and press Ctrl+Delete. Name each row to correspond to a Section of your custom Expense Report.

9. **Determine the Label settings.** The orientation of the data fields (Row, Column) appears in the yellow section of the table.

SAMPLE1.XLT							
ROW				COLUMN			
Fixed Label		Variable Label by		Fixed Label		Variable Label by	
Day/Date	Expense Type	Day/Date	Expense Type	Day/Date	Expense Type	Day/Date	Expense Type
		X					X

Determine whether the **Rows** will contain expense or date information, and place an "x" in the appropriate cell. When you do this, you also define whether the label is Fixed or Variable. You can place only one "x" in the Row section (columns 2–5).

Determine whether the **Columns** will contain expense or date information, and place an "x" in the appropriate cell. When you do this, you also define whether the label is Fixed or Variable. You can place only one "x" in the Column section (columns 6–9).

10. **Define the dimensions of the Section.** The dimensions of the Section appear in the green columns (10–13).

# of Rows	# of Columns	Start Row	Start Column
36		12	1

of Rows Represents the total number of rows in the Section, excluding any header or total rows. In other words, this includes only the number of rows in the Section where your organizer data will be placed.

of Columns Represents the total number of columns in the Section, excluding any header or total columns. In other words, this includes only the number of columns in the Section where your organizer data will be placed.

Start Row Is the number of the first row of the Section that will be filled with your organizer data.

Start Column Is the number of the first column of the Section that will be filled with your organizer data.

11. **Define the Dates and Intervals.** The dates and intervals between dates appears in the light blue columns (14–17).

Date	Intervals Between		
Date	Dates	Start day	Day
1	0		

In the **Date** cell, enter the row or column number where all the date information will be placed.

In the **Dates** cell, enter the number of blank columns (or rows) separating the date fields. If there are no blank columns (or rows) between date entries, leave this number set to zero.

In the **Start Day** cell, enter the day of the week that starts the expense reporting period. Enter a three-character abbreviation for the day (e.g., Sun, Mon, Tue).

In the **Day** cell, enter the row or column number where all the day information will be placed. If the dates are in a row, enter the row number. If the dates are in a column, enter the column number.

12. Define whether the Section is in list format. This setting appears in the light purple columns (18–19).

Listing Format	Expense Type
YES	8

If the Section will present the data in a list format, enter the word “yes”. Otherwise, enter the word “no”. The following diagram shows data presented in a list format:

6	Date	Category	Type	Amount	Country	Payment Type
7						
8						
9						
10						
11						

Only if your section is in list format: In the Expense Type cell, enter the number of the row or column where the expense description will be placed. Expense amounts can be entered in several different columns or rows if required by your template. *Expense type labels* must all appear in the same column.

13. Enter the row or column numbers for the expense types that appear in the Section. These settings appear in the aqua columns (20–48).

Expense Types					
Airfare	Breakfast	Bus	Business Meals	Car Rental	Dinner
4	4	4	4	4	4

For these settings, simply enter the row or column number for the expense types that you want to appear in the Section. Note that you can use a row or column number more than once. An example of this would be meals that encompass breakfast, lunch, dinner, and snacks. In the previous example, all expense items would be populated into row/column 4 of the custom Expense Report.

14. **Complete the table.** All of the remaining columns (49–57) in the table are used to define the column or row number that corresponds to the description.
15. **Mark a Section for prepaid expenses (yellow column).** If a row in the map table is for prepaid (company paid) expenses, type a “yes” in the cell on that Section’s row. Type “no” in all the cells of this column that do not pertain to prepaid expenses.

57
PrePaid
NO
YES
NO

16. Repeat steps 9 through 15 for each Section that you have defined for your custom Expense Report.
17. **Map Expense Report Options dialog (magenta section).** The Expense Report Options dialog has five fields where you can fill in data for the header on your expense report. Use this section to specify the row and column on your template where this information will be mapped.

Employee Name		Department	
Header 1 Row	Header 1 Col	Header 2 Row	Header 2 Col
2	5	2	9

Because header data is not related to any particular Section, you have to fill in only one row. If the item does not appear on your template, leave these cells blank.

Using applications other than Microsoft Excel

You can use applications other than Microsoft Excel (such as Lotus 1-2-3 or Quattro Pro) to open and manipulate the Expense data on your computer. The data file is named "Expense.txt," and is stored in the Expense folder, within the folder containing the organizer user data.

Expense data in the Expense.txt file is in tab-delimited format.

Expense file details

The Expense.txt file contains four groups of data. It will be easier to see these four distinct groups of data if you open the file with a spreadsheet application.

Trips	Shows the number of Expense application categories, and lists each one followed by an "end" statement.
Currency	Shows how many currencies were used for the Expense data, and lists the countries that correspond to that currency.
Trip	Shows the number of expenses by category, and lists the expenses for each category.
Expenses	Shows the total number of expenses, and lists them chronologically.

Appendix D

Non-ASCII Characters for Login Scripts

The following information enables you to create custom login scripts that require non-ASCII characters. It is provided for advanced users who understand the use and requirements of such characters in a custom login script.

Use of ^char

You may use the caret (^) to transmit ASCII command characters. If you send ^*char*, and the ASCII value of *char* is between @ and _, then the character is automatically translated to a single-byte value between 0 and 31.

For example, ^M is converted to a carriage return. If char is a value between a and z, then the character sequence is translated to a single-byte value between 1 and 26. If char is any other value, then the character sequence is not subject to any special processing.

For example, the string "Joe^M" transmits Joe, followed by a carriage return.

Carriage return and line feed

You may include carriage return and line feed commands as part of the login script, when entered in the following format:

<cr>	Sends or receives a carriage return
<lf>	Sends or receives a line feed

For example, the string "waitfor Joe<cr><lf>" waits to receive Joe followed by a carriage return and line feed from the remote computer before executing the next command in the script.

Literal characters

The backslash (\) character defines that the *next character* is transmitted as a literal character, and is not subject to any special processing ordinarily associated with that character.

Examples:

- | | |
|----|--|
| \^ | Includes a caret as part of the string |
| \< | Includes a < as part of the string |
| \\ | Includes a backslash as part of the string |

Warranty and Other Product Information

Limited warranty

HARDWARE: Palm Computing, Inc., a subsidiary of 3Com Corporation (collectively "3Com"), warrants to the original end user ("Customer") that this product will be free from defects in workmanship and materials, under normal use, for one year from the date of original purchase from 3Com or its authorized reseller. 3Com's sole obligation under this express warranty shall be, at 3Com's option and expense, to replace the product or part with a comparable product or part, repair the product or part, or if neither repair nor replacement is reasonably available, 3Com may, in its sole discretion, refund to Customer the purchase price paid for the product or part. Replacement products or parts may be new or reconditioned. 3Com warrants any replaced or repaired product or part, and any hardware upgrade to which Customer is entitled under an agreement between Customer and 3Com, for a period of ninety (90) days from shipment, or through the end of the original warranty, whichever is longer. All products or parts that are replaced become the property of 3Com.

Accessory products, as listed in the applicable 3Com catalogue, are not covered under this Limited Warranty except for the modem for the connected organizer, the cradles, cables, memory upgrades, and leather items sold under the 3Com® brand. 3Com shall not be responsible for Customer's software, firmware, information, or memory data contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

SOFTWARE: 3Com warrants to Customer that the Palm™ Desktop organizer software and Palm OS™ software licensed from it will perform in substantial conformance to their program specifications, for a period of ninety (90) days from the date of original purchase from 3Com or its authorized reseller. 3Com warrants the media containing software against failure during the warranty period. No updates are provided. 3Com does not provide any warranty for Adobe® Acrobat® Reader or any other third-party applications software that is licensed to Customer by the third party. 3Com's sole obligation with respect to this express warranty shall be (at 3Com's discretion) to refund the purchase price paid by Customer for any defective software product, or to replace any defective media with software which substantially conforms to applicable 3Com published specifications. 3Com makes no warranty or representation that its software products will meet Customer's requirements or will work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected.

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Any Palm Computing platform application supplied by 3Com that makes correct use of Palm Computing platform date and time functions will not have a problem transitioning to the year 2000. The date and time utilities for the Palm Computing platform use 32 bits to store seconds, starting at January 1, 1904. This approach allows the correct representation of dates through February 5, 2040. The Date Book software currently displays dates through December 31, 2031. Provided the product is still being sold by 3Com, 3Com will make software enhancements to remove these limitations well in advance of these dates.

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September 3, 1998

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Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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Palm V Product Family



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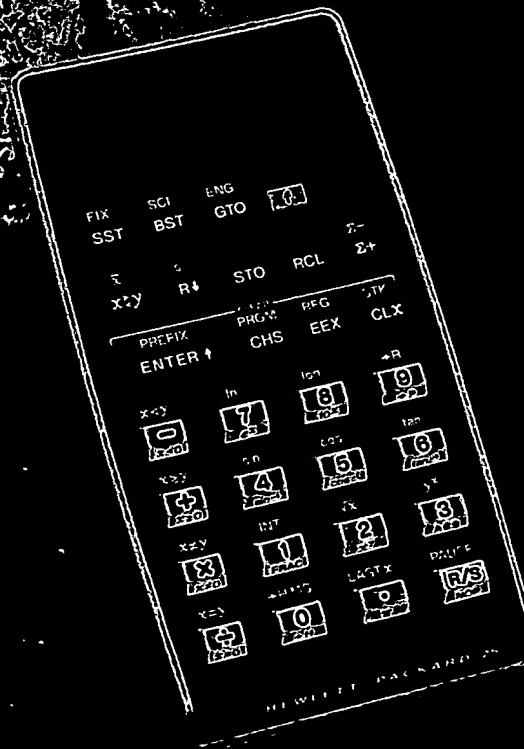
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HEWLETT-PACKARD

HP-25

Owner's Handbook



"The success and prosperity of our company will be assured only if we offer our customers superior products that fill real needs and provide lasting value, and that are supported by a wide variety of useful services, both before and after sale."

*Statement of Corporate Objectives.
Hewlett-Packard*

When Messrs. Hewlett and Packard founded our company in 1939, we offered one superior product, an audio oscillator. Today, we offer more than 3,000 quality products, designed and built for some of the world's most discerning customers.

Since we introduced our first pocket calculator in 1972, we've sold over 700,000 world-wide. Their owners include Nobel laureates, astronauts, mountain climbers, businessmen, doctors, students, and housewives.

Each of our pocket calculators is precision crafted and designed to solve the problems its owner can expect to encounter throughout a working lifetime.

HP calculators fill real needs. And they provide lasting value.

(Cover background courtesy of NASA)



HP-25

Owner's Handbook

August 1975

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The HIP-25 Programmable Scientific Calculator

Function Key Index

Manual RUN Mode. PRGM-RUN switch FROM  RUN set to RUN.

Function keys pressed from the keyboard execute individual functions as they are pressed. Input numbers and answers are displayed.

- | | | |
|---|---|--|
| FIX Fixed display. Followed by a number key, selects fixed point notation display (page 26). | % Percent. Calculates x% of y (page 54). | Σ^- Summation minus. Subtracts values from storage registers R_3 through R_7 for correcting Σ^+ summation entries (page 69). |
| SCI Scientific display. Followed by a number key, selects scientific notation display (page 27). | S Standard deviation. Calculates standard deviation using numbers totaled by Σ^+ in storage registers R_3 through R_7 (page 68). | Σ^+ Summation. Sums numbers in X- and Y-registers into storage registers R_3 through R_7 (page 66). |
| ENG Engineering display. Followed by a number key, selects engineering notation display (page 28). | R\downarrow Roll down. Rolls down contents of stack for viewing in displayed X-register (page 36). | PREFIX Clear prefix. After $\frac{1}{x}$, $\frac{1}{y}$, $\frac{1}{z}$, STO , RCL or GTO , cancels that key (page 50). |
| $\frac{1}{x}$ Reciprocal. Calculates reciprocal of the number in the display (page 52). | STO Store. Followed by number key, stores displayed number in storage register (0-7) specified. Followed by arithmetic operator key, performs storage register arithmetic (page 55). | ENTER\rightarrow Copies number in displayed X-register into Y-register (page 16). |
| $\frac{1}{y}$ Prefix key. Press before function key to select function printed in gold on the keyboard above function key (page 13). | CHS Change sign. Changes sign of displayed number or exponent of 10 (page 14). | DEG Degrees. Sets decimal degree mode for trigonometric functions (page 59). |
| $\frac{1}{z}$ Prefix key. Press before function key to select function printed in blue on slanted face of function key (page 13). | RCL Recall. Followed by number key, recalls value from storage register (0-7) specified into the displayed X-register (page 55). | REG Clear registers. Replaces contents of storage registers R_0 through R_7 with zeros (page 56). |
| \bar{x} Mean. Calculates mean (average) of the numbers totaled by Σ^+ in storage register R_7 (page 67). | | |
| $x \leftrightarrow y$ x exchange y. Exchanges contents of X- and Y-registers (page 37). | | |

EE^x Enter exponent. After pressing, next numbers keyed in are exponents of 10 (page 31).

RAD Radians. Sets radians mode for trigonometric functions (page 59).

STK Clear stack. Replaces contents of X-, Y-, Z-, and T-registers with zeros (page 37).

CLX Clear x. Clears the displayed X-register to zero (page 15).

GRD Grads. Sets grads mode for trigonometric functions (page 59).

+ **-** **x** **÷**
Arithmetic operators (page 16).

ln Natural logarithm. Computes natural logarithm (base e, 2.718...) of value in displayed X-register (page 63).

e^x Natural antilog. Raises e (2.718...) to the power of value in displayed X-register (page 63).

log Common logarithm. Computes common logarithm (base 10) of value in displayed X-register (page 63).

10^x Common antilogarithm. Raises 10 to the power of number in displayed X-register (page 63).

↔R Rectangular coordinate conversion. Converts polar magnitude and angle in X- and Y-registers to rectangular x and y coordinates (page 62).

↔P Polar coordinate conversion. Converts x, y rectangular coordinates placed in X- and Y-registers to polar magnitude and angle (page 62).

sin **cos** **tan** Sine, cosine, and tangent. Calculate the sine, cosine, or tangent of value in displayed X-register (page 59).

sin⁻¹ **cos⁻¹** **tan⁻¹**
Arc sine, arc cosine, arc tangent. Calculate inverse trigonometric function of value in display (page 59).

INT Integer. Leaves only integer portion of number in displayed X-register by truncating fractional portion (page 51).

FRAC Fraction. Leaves only fractional portion of number in displayed X-register by truncating integer portion (page 51).

√x Computes square root of number in displayed X-register (page 52).

x² Computes square of number in displayed X-register (page 53).

y^x Raises number in Y-register to the power of the number in the displayed X-register (page 64).

ABS Absolute. Gives the absolute value of the displayed number (page 51).

↔HMS Converts displayed decimal hours or degrees to hours, minutes, seconds format (page 60).

↔H Converts displayed value in hours, minutes, seconds format to decimal hours or degrees (page 60).

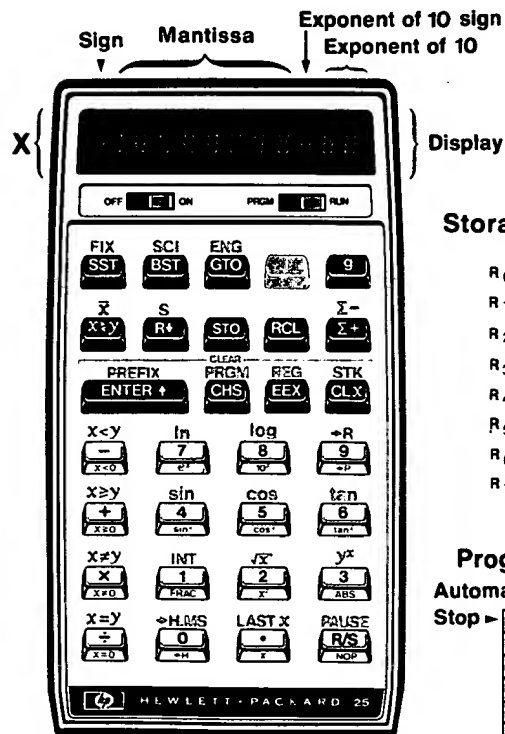
LASTX Recalls number displayed before the previous operation back into the displayed X-register (page 49).

π Pi. Places value of pi (3.14159...) into displayed X-register (page 53).

HP-25 Memory

Automatic Memory Stack

T	0.00	} Stack Registers
Z	0.00	
Y	0.00	



Storage Registers

R 0	0.00
R 1	0.00
R 2	0.00
R 3	0.00
R 4	0.00
R 5	0.00
R 6	0.00
R 7	0.00

Program Memory

Automatic

Stop >	00
	01 13 00
	02 13 00
	03 13 00
	04 13 00
	05 13 00
	06 13 00
	47 13 00
	48 13 00
	49 13 00

Programming Key Index


PROGRAM Mode

PRGM-RUN switch
set to: PRGM  RUN

Function keys are recorded in program memory. Display shows program memory step number and the keycode (keyboard row and location in row) of the function key.

Active keys:

In *program mode* only three keys are active. These keys cannot be recorded in program memory.


 **Clear**
program. Clears program memory to GTO 00 instructions and resets calculator so operations begin at step 00 of program memory (**page 78**).


Automatic RUN Mode


PRGM-RUN switch
set to: PRGM  RUN

Function keys may be executed as part of a recorded program or individually by pressing from the keyboard. Input numbers and answers are displayed, except where indicated.


Pressed from keyboard:


 **Resets**
calculator so operations begin at step 00 of program memory (**page 78**).

 **Run/stop.** Begins execution of a stored program. Stops execution if program is running (**page 83**).

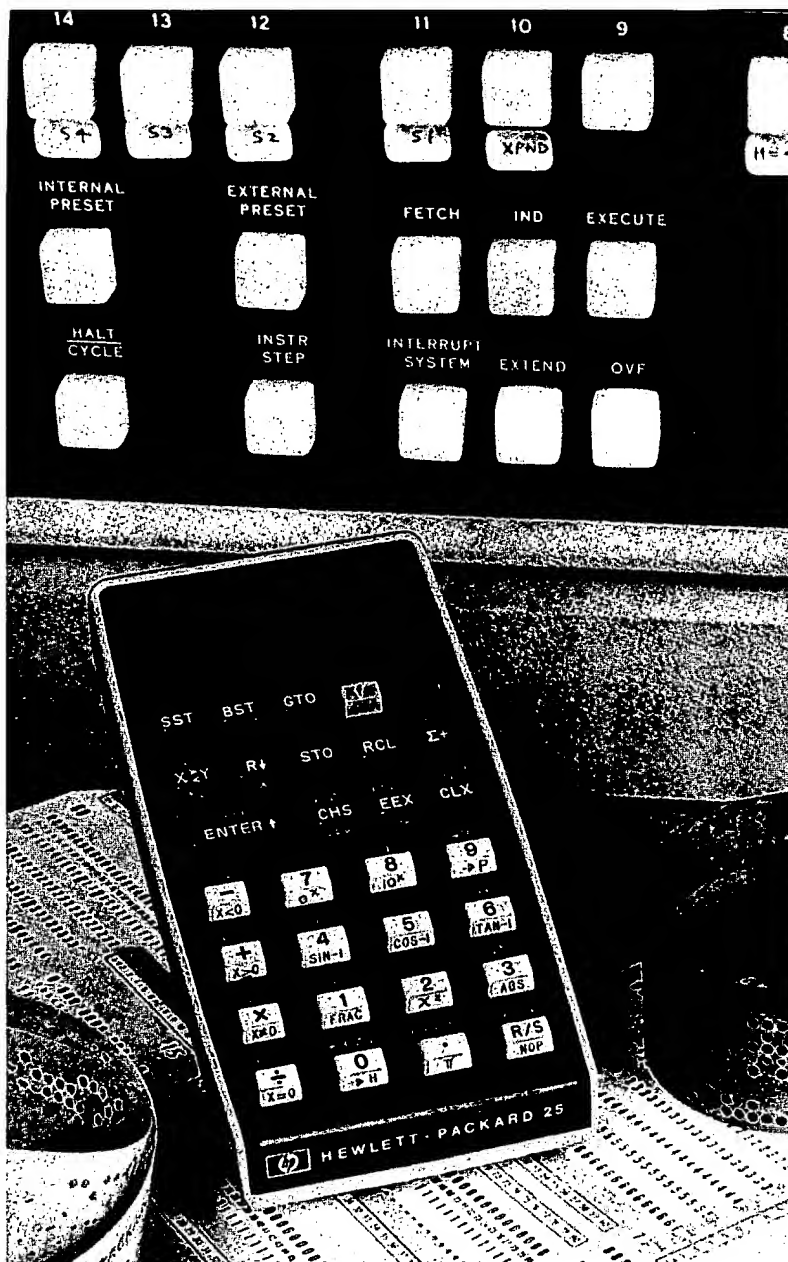
 **Go to.** Followed by two-digit number, positions calculator to that step number of program memory. No instructions are executed (**page 82**).

Executed as a recorded program instruction:

 **Run/stop.** Stops program execution (**page 83**).

 **Go to.** Followed by a two-digit number, causes calculator to execute the instruction at the specified step number next, and continue program execution sequentially from there (**page 87**).

PROGRAM Mode	Automatic RUN Mode	
<p>Active keys :</p> <p>SST Single step. Displays step number and contents of next program memory step (page 81).</p> <p>BST Back step. Displays step number and contents of previous program memory step (page 81).</p>	<p>Pressed from keyboard:</p> <p>SST Single step. Displays step number and keycode of current program memory step when pressed; executes instruction, displays result, and moves to next step when released (page 92).</p> <p>BST Back step. Displays step number and keycode of previous program memory step when pressed; displays original contents of X-register when released. No instructions are executed (page 93).</p> <p>Any key. Pressing any key on the keyboard stops execution of a program.</p>	<p>Executed as a recorded program instruction:</p> <p>PAUSE Pause. Stops program execution for 1 second and displays contents of X-register, then resumes program execution (page 84).</p> <p>X<0 X≥0 X≠0 X=0</p> <p>Conditionals. Each tests value in X-register against that in Y-register or 0 as indicated. If true, calculator executes instruction in next program memory step. If false, calculator skips next step (page 90).</p> <p>NOP No operation. Calculator executes no operation and continues program execution sequentially with the instruction in the next program memory step (page 94).</p>



The HP-25 Means Painless Programming

Your HP-25 is a versatile, handheld electronic calculator that uses the powerful Hewlett-Packard logic system to compute answers to complex mathematical problems in either of two modes:

- **Manual problem solving.** You work step-by-step through the toughest of problems, choosing from among the dozens of functions available to calculate the correct answer quickly and easily.
- **Programmed problem solving.** The HP-25 memorizes a sequence of up to 49 different functions as you press them, and then repeats that sequence automatically as often as you wish to solve a particular type of problem.

That's all there is to it! A *program* is nothing more than a sequence of manual keystrokes that is remembered by the calculator. You can then *execute* the program as often as you like. *No prior computer programming experience is necessary for HP-25 calculator programming.*





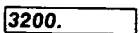


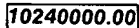
To see the close relationship between the manual solution to a problem and a programmed solution, let's solve a problem manually, and then use a program to solve the same problem and others like it.


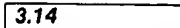
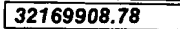
Manual Problem Solving

To calculate the surface area of a sphere, the formula $A = \pi d^2$ can be used, where: A is the surface area, π is the value of pi, 3.1415..., and d is the diameter of the sphere.

Ganymede, one of Jupiter's 12 moons, has a diameter of 3200 miles. To use the HP-25 to manually compute the area of Ganymede, you can press the following keys in order:

First, slide the calculator OFF  ON switch to ON, and slide the PROG  RUN switch to RUN.

Then press	Display	
   		Diameter of Ganymede.
		
		Square of the diameter.


 The quantity π .
 Area of Ganymede in square miles.




Programmed Problem Solving


If you wanted the surface areas of each of Jupiter's 12 moons, you could repeat the above procedure 12 times. However, you might wish to write a *program* that would calculate area of a sphere from its diameter, instead of pressing all the keys for each moon.


To calculate the area of a sphere using a program, you should first *write* the program, then you must *record* the program into the calculator, and finally you *run* the program to calculate the answer.

Writing the Program: You have already written it! A program is nothing more than the series of keystrokes you would execute to solve the same problem manually.

Recording the Program: To record the keystrokes of the program into the calculator:

1. Slide the PRGM-RUN switch  to PRGM (*program*).
2. Press   to clear the calculator.
3. Press the following keys in order. (When you are recording a program, the display gives you information that you will find useful later, but you can ignore the display for now.)


 These keys are the same keys you pressed to solve the problem manually.

Running the Program: Slide the PRGM-RUN switch  back to RUN and press in order



Now all you have to do to calculate the area of any sphere is key in the value for its diameter and press the **RS** (run/stop) key. When you press **RS** the sequence of keystrokes you recorded is automatically executed by the calculator, giving you the same answer you would have obtained manually:

For example, to calculate the area of Ganymede:

Press	Display	
3200	3200.	
RS	32169908.78	Square miles.

With the program you have recorded, you can now calculate the area of any of Jupiter's moons—in fact, of *any* sphere—using its diameter. You have only to leave the calculator in RUN mode and key in the diameter of each sphere that you wish to compute, then press **RS**. For example, to compute the surface area of Jupiter's moon Io with a diameter of 2310 miles:

Press	Display	
2310 RS	16763852.56	Square miles.

For the moons Europa, diameter 1950 miles, and Callisto, diameter 3220 miles:

Press	Display	
1950 RS	11945906.07	Area of Europa in square miles.
3220 RS	32573289.27	Area of Callisto in square miles.

Programming the HP-25 is *that* easy! The calculator remembers a series of keystrokes and then executes them when you press the **RS** key.

The early portions of this handbook show you how easy it is to manually use the power of the HP-25; while in section 5, Programming, you will find a complete guide to HP-25 calculator programming. Even if you have used other pocket calculators or programmed large computers, you will want to take a good look at this handbook. It explains the unique HP logic system that makes simple answers out of complex problems, and HP-25 features that make programming painless. When you see the simple power of your HP-25, you'll become an apostle just as have some 700,000 HP calculator owners before you.





Section 1

Getting Started

Your HP-25 is shipped fully assembled, including a battery. You can begin using your calculator immediately by connecting the cord from the ac adapter/battery charger to the calculator and plugging the charger into an ac outlet. If you want to use your HP-25 on battery power alone, you should charge the battery for 6 hours first. Whether you operate from battery power or from power supplied by the charger, *the battery must always be in the calculator.*

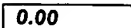
To begin:

- ▣ Slide the PRGM-RUN switch  to RUN.
- ▣ Slide the OFF-ON switch  to ON.

Display



With the PRGM-RUN switch set to RUN, the bright red display that you see when you turn the calculator ON gives you two kinds of information:

1. You see numbers as you key them in.
2. You see all intermediate and final answers as they are calculated.

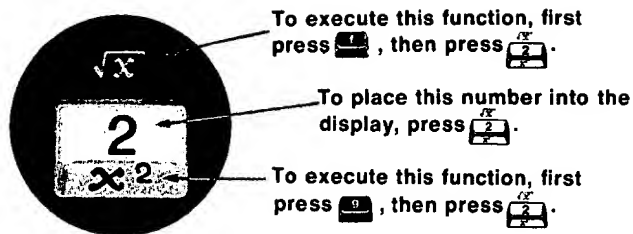
When you first turn the calculator ON, the display is set to  to show you that all zeros are present there.

Keyboard

Most keys on the keyboard perform three functions. One function is indicated by the symbol on the flat face of the key, another by the blue symbol on the slanted key face, and a third by the gold symbol written above the key on the calculator case.

- ▣ To select the function printed in blue on the slanted face of the key, first press the blue prefix key , then press the function key.
- ▣ To select the function printed on the flat face of the key, press the key.
- ▣ To select the function printed in gold above the key, first press the gold prefix key , then press the function key.

14 Getting Started



In this handbook, the selected key function will appear in the appropriate color (either gold or blue), like this: \sqrt{x} x^2 .

Keying in Numbers

Key in numbers by pressing the number keys in sequence, just as though you were writing on a piece of paper. The decimal point must be keyed in if it is part of the number.

For example:

Key in 148.84 by pressing the keys	Display
$\boxed{1} \boxed{4} \boxed{8} \boxed{.} \boxed{8} \boxed{4}$	$\boxed{148.84}$

The resultant number 148.84 is seen in the display.

Negative Numbers

To key in a negative number, press the keys for the number, then press **CHS** (*change sign*). The number, preceded by a minus (–) sign, will appear in the display. For example, to change the sign of the number now in the display:

Press	Display
CHS	$\boxed{-148.84}$

You can change the sign of either a negative or a positive number in the display. For example, to change the sign of the – 148.84 now in the display back to positive:

Press	Display
CHS	$\boxed{148.84}$

Notice that only negative numbers are given a sign in the display.

Clearing

You can clear any numbers that are in the display by pressing **CLX** (clear *x*). This key erases the number in the display and replaces it with 0.

Press	Display
-------	---------

CLX	0.00
------------	------

If you make a mistake while keying in a number, clear the entire number string by pressing **CLX**. Then key in the correct number.

Functions

In spite of the dozens of functions available on the HP-25 keyboard, you will find the calculator simple to operate by using a single, all-encompassing rule: *When you press a function key, the calculator immediately executes the function written on that key.*

Pressing a function key causes the calculator to immediately perform that function.

For example, to calculate the square root of 148.84 merely:

Press	Display
-------	---------

148.84	148.84
□	148.84
√x	12.20

To square the result:

Press	Display
-------	---------

□	12.20
x²	148.84

√x and **x²** are examples of one-number function keys; that is, keys that execute upon a *single* number. All function keys in the HP-25 operate upon either one number or two numbers at a time (except for statistics keys like **Σ+** and **Σ-**—more about these later).

Function keys operate upon either one number or two numbers.

One-Number Functions

To use any one-number function key:

1. Key in the number.
2. Press the function key (or press the applicable prefix key, then the function key).

For example, to use the one-number function $\frac{1}{x}$ key, you first key in the number represented by x , then press the function key. To calculate $1/4$, key in 4 (the x -number) and press $\frac{1}{x}$.

Press	Display
4	4.
$\frac{1}{x}$	4.
	0.25

Now try these other one-number function problems. Remember, *first key in the number, then press the function*:

$\frac{1}{25}$	=	0.04	
$\sqrt{2500}$	=	50.00	
10^5	=	100000.00	(Use the 10^x key.)
$\sqrt{3204100}$	=	1790.00	
$\log 12.58925411$	=	1.10	
71^2	=	5041.00	

Two-Number Functions

Two-number functions are functions that must have two numbers present in order for the operation to be performed. $+$, $-$, \times , and \div are examples of two-number function keys because you cannot add, subtract, multiply, or divide unless there are two numbers present in the calculator. Two-number functions work the same way as one-number functions—that is, the operation occurs when the function key is pressed. Therefore, *both numbers must be in the calculator before the function key is pressed*.

When more than one number must be keyed into the calculator before performing an operation, the **ENTER** key is used to separate the two numbers.

Use the **ENTER** key whenever more than one number must be keyed into the calculator before pressing a function.

If you key in only one number, you never need to press **ENTER**.

To place two numbers into the calculator and perform an operation:

1. Key in the first number.
2. Press **ENTER** to separate the first number from the second.
3. Key in the second number.
4. Press the function key to perform the operation.

For example, you add 12 and 3 by pressing:

12	The first number.
ENTER	Separates the first number from the second.
3	The second number.
+	The function.

The answer, **15.00**, is displayed.

Other arithmetic functions are performed the same way:

To perform	Press	Display
12 - 3	12 ENTER 3 -	9.00
12 × 3	12 ENTER 3 ×	36.00
12 ÷ 3	12 ENTER 3 ÷	4.00

The **y^x** key is also a two-number operation. It is used to raise numbers to powers, and you can use it in the same simple way that you use every other two-number function key:

1. Key in the first number.
2. Press **ENTER** to separate the first number from the second.
3. Key in the second number (power).
4. Perform the operation (press **y^x**, then **=**).

When working with any function key (including **y^x**), you should remember that the displayed number is always designated by *x* on the function key symbols.

The number displayed is always *x*.

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So, \sqrt{x} means square root of the displayed number, $\frac{1}{x}$ means $\frac{1}{\text{displayed number}}$, etc.

Thus, to calculate 3^6 :

Press	Display
3	3.
ENTER	3.00
6	6.
\uparrow	6.
\rightarrow^x	729.00

X, the displayed number, is now 6.

The answer.

Now try the following problems using the \rightarrow^y key, keeping in mind the simple rules for two-number functions:

$$16^4 \quad (16 \text{ to the 4th power}) = 65536.00$$

$$81^2 \quad (81 \text{ squared}) = 6561.00$$

(You could also have done this as a one-number function using x^2 .)

$$225^{.5} \quad (\text{Square root of } 225) = 15.00$$

(You could also have done this as a one-number function by using \sqrt{x} .)

$$2^{16} \quad (2 \text{ to the 16th power}) = 65536.00$$

$$16^{.25} \quad (4\text{th root of } 16) = 2.00$$

Chain Calculations

The speed and simplicity of operation of the HP-25's Hewlett-Packard logic system become most apparent during chain calculations. Even during the longest of calculations, *you still perform only one operation at a time*, and you see the results as you calculate—the Hewlett-Packard automatic memory stack stores up to four intermediate results inside the calculator until you need them, then inserts them into the calculation. This

system makes the process of working through a problem as natural as it would be if you were working it out with pencil and paper, but the calculator takes care of the hard part.

For example, solve $(12 + 3) \times 7$.

If you were working the problem with a pencil and paper, you would first calculate the intermediate result of $(12 + 3)$

$$\begin{array}{r} \cancel{(12 + 3)} \times 7 = \\ 15 \end{array}$$

. . . and then you would multiply the intermediate result by 7.

$$\begin{array}{r} \cancel{(12 + 3)} \times 7 = 105 \\ 15 \times 7 \end{array}$$

You work through the problem exactly the same way with the HP-25, one operation at a time. You solve for the intermediate result first . . .

$$(12 + 3)$$

Press **Display**

12	12.
ENTER	12.00
3	3.
+	15.00

Intermediate result .

. . . and then solve for the final answer. You don't need to press **ENTER** to store the intermediate result—the HP-25 automatically stores it inside the calculator when you key in the next number. To continue. . . .

Press **Display**

7	7.
×	105.00

The intermediate result from the preceding operation is automatically stored inside the calculator when you key in this number.

Pressing the function key multiplies the new number and the intermediate result, giving you the final answer.

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Now try these problems. Notice that for each problem you only have to press **ENTER** to insert a pair of numbers into the calculator—each subsequent operation is performed using a new number and an automatically stored intermediate result.

To solve	Press	Display
$\frac{(2 + 3)}{10}$	2 ENTER 3 + 10 ÷	0.50
$3(16 - 4)$	16 ENTER 4 - 3 ×	36.00
$\frac{14 + 7 + 3 - 2}{4}$	14 ENTER 7 + 3 + 2 - 4 ÷	5.50

Problems that are even more complicated can be solved in the same simple manner, using the automatic storage of intermediate results. For example, to solve $(2 + 3) \times (4 + 5)$ with a pencil and paper, you would:

$$(2 + 3) \times (4 + 5)$$

First solve for the contents of these parentheses. . . .

. . . . and then for these parentheses

. . . . and then you would multiply the two intermediate answers together.

You work through the problem the same way with the HP-25. First you solve for the intermediate result of $(2 + 3)$. . .

	Press	Display
$(2 + 3) \times (4 + 5)$ 5	2	2.
	ENTER	2.00
	3	3.
	+	5.00
		Intermediate result.

Then add 4 and 5:

(Since you must now key in another *pair* of numbers before you can perform a function, you use the **ENTER** key again to separate the first number of the pair from the second.)

Procedure	Press	Display
$(2 + 3) \times (4 + 5)$ 5 9	4 ENTER 5 +	9.00

Then multiply the intermediate answers together for the final answer:

Procedure	Press	Display
$(2 + 3) \times (4 + 5)$ 5 9	x	45.00

Notice that you didn't need to write down or key in the intermediate answers from inside the parentheses before you multiplied—the HP-25 automatically stacked up the intermediate

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results inside the calculator for you and brought them out on a last-in, first-out basis when it was time to multiply.

No matter how complicated a problem may look, it can always be reduced to a series of one- and two-number operations. Just work through the problem in the same logical order you would use if you were working it with a pencil and paper.

For example, to solve:

$$\frac{(9 \times 8) + (7 \times 2)}{(4 \times 5)}$$

Press	Display	
9 ENTER 8 X	72.00	Intermediate result of (9×8) .
7 ENTER 2 X	14.00	Intermediate result of (7×2) .
+	86.00	(9×8) added to (7×2) .
4 ENTER 5 X	20.00	Intermediate result of (4×5) .
÷	4.30	The final answer.

Now try these problems. Remember to work through them as you would with a pencil and paper, but don't worry about intermediate answers—they're handled automatically by the calculator.

Problems

$$(2 \times 3) + (4 \times 5) = \boxed{26.00}$$

$$\frac{(14 + 12) \times (18 - 12)}{(9 - 7)} = \boxed{78.00}$$

$$\frac{\sqrt{16.38 \times 5}}{.05} = \boxed{181.00}$$

$$4 \times (17 - 12) \div (10 - 5) = \boxed{4.00}$$

$$\sqrt{(2 + 3) \times (4 + 5)} + \sqrt{(6 + 7) \times (8 + 9)} = \boxed{21.57}$$

A Word About the HP-25

Now that you've learned how to use the calculator, you can begin to fully appreciate the benefits of the Hewlett-Packard logic system. With this system, you enter numbers using a parenthesis-free, unambiguous method called RPN (Reverse Polish Notation).

It is this unique system that gives you all these calculating advantages whether you're writing keystrokes for an HP-25 program or using the HP-25 under manual control:

- *You never have to work with more than one function at a time.* The HP-25 cuts problems down to size instead of making them more complex.
- *Pressing a function key immediately executes the function.* You work naturally through complicated problems, with fewer keystrokes and less time spent.
- *Intermediate results appear as they are calculated.* There are no "hidden" calculations, and you can check each step as you go.
- *Intermediate results are automatically handled.* You don't have to write down long intermediate answers when you work a problem.
- *Intermediate answers are automatically inserted into the problem on a last-in, first-out basis.* You don't have to remember where they are and then summon them.
- *You can calculate in the same order you do with pencil and paper.* You don't have to think the problem through ahead of time.

The HP system takes a few minutes to learn. But you'll be amply rewarded by the ease with which the HP-25 solves the longest, most complex equations. With HP, the investment of a few moments of learning yields a lifetime of mathematical bliss.



Section 2

Controlling the Display

In the HP-25, numbers in the display normally appear rounded to only two decimal places. For example, the fixed constant π , which is *actually* in the calculator as 3.141592654, normally *appears in the display as* **3.14** (unless you tell the calculator to show you the number rounded to a greater or lesser number of decimal places).

Although a number is normally shown to only two decimal places, the HP-25 always computes internally using each number as a 10-digit mantissa and a two-digit exponent of 10. For example, when you compute 2×3 , you *see* the answer to only two decimal places:

Press	Display
2 ENTER 3 x	6.00

However, inside the calculator all numbers have 10 digit mantissas and two-digit exponents of 10. So the calculator *actually* calculates using full 10-digit numbers:

2.000000000 $\times 10^{00}$ **ENTER** 3.000000000 $\times 10^{00}$ **x**

yields an answer that is actually carried to 10 digits:

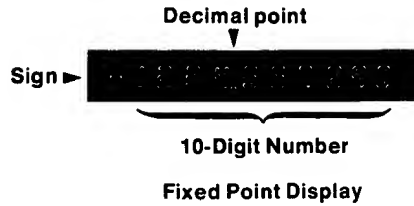
You see only these digits. . . **6.000000000 $\times 10^{00}$** . . . but these digits are also present.

Display Control Keys

FIX allows numbers to be displayed in fixed decimal point format, **SCI** displays numbers in scientific notation format, and **ENG** displays numbers in engineering notation, with exponents of 10 shown in multiples of three (e.g., 10^3 , 10^{-6} , 10^9).

Display control alters only the *manner* in which numbers are displayed in the HP-25. The actual number itself is not altered by any of the display control keys. No matter what notation you select, these rounding options affect the display only—the HP-25 always calculates internally with a full 10-digit number (multiplied by 10 raised to a two-digit exponent).

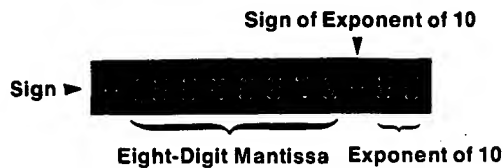
Fixed Point Display



Using fixed point display you can specify the number of places to be shown after the decimal point. It is selected by pressing **FIX**, followed by a number key to specify the number of decimal places (0-9) to which the display is to be rounded. The displayed number begins at the left side of the display and includes trailing zeros within the setting selected. When the calculator is turned OFF, then ON, it "wakes up" in fixed point notation with the display rounded to two decimal places. For example:

Press	Display	
(Turn the calculator OFF, then ON.)	0.00	
123.4567 ENTER	123.46	Display is rounded off to two decimal places. Internally, however, the number maintains its original value of 123.4567.
FIX 4	123.4567	
FIX 7	123.4567000	
FIX 0	123.	
FIX 2	123.46	Normal FIX 2 display.

Scientific Notation Display



Scientific Notation Display

(This means $-1.2345678 \times 10^{-23}$)

In scientific notation each number is displayed with a single digit to the left of the decimal point followed by a specified number of digits (up to seven) to the right of the decimal point and multiplied by a power of 10. It is particularly useful when working with very large or small numbers.

Scientific notation is selected by pressing $\boxed{\text{SCI}}$ followed by a number key to specify the number of decimal places to which the number is rounded. The display is left-justified and includes trailing zeros within the selected setting. For example:

Press	Display	
123.4567 $\boxed{\text{ENTER}}$	123.46	Normal FIX 2 display.
$\boxed{1} \boxed{\text{SCI}} \boxed{2}$	1.23 02	Displays 1.23×10^2 .
$\boxed{1} \boxed{\text{SCI}} \boxed{4}$	1.2346 02	Displays 1.2346×10^2 .
$\boxed{1} \boxed{\text{SCI}} \boxed{7}$	1.2345670 02	Displays 1.2345670×10^2 .

In scientific notation, although the calculator displays a maximum of seven digits after the decimal point, it always maintains the full 10-digit number and the two-digit exponent of 10 internally. The portion of the number that is not displayed affects the rounding of the displayed portion.

For example, if you key in 1.000000094 and specify full scientific notation display ($\boxed{1} \boxed{\text{SCI}} \boxed{7}$), the calculator display rounds off to the seventh digit after the decimal point:


1.000000094
 ↑
 Calculator rounds to this digit in SCI 7.

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Press	Display
1.000000094	1.000000094
\square SCI 7	1.0000001 00

In SCI 8, the display would round off to the eighth digit after the decimal point, but you can see only out to seven digits after the decimal:

1.000000094

You see to here . . .  . . . but the calculator display rounds to here in SCI 8.

Press	Display
\square SCI 8	1.0000000 00

You can see that if you had keyed in 1.000000095, SCI 8 would also have caused the display to round the seventh and final digit after the decimal to a one (1).

Engineering Notation Display

Specified Digits




First Three Digits
Always Present

Exponent of Ten Always
a Multiple of Three

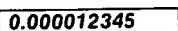
Engineering Notation Display



Engineering notation allows all numbers to be shown with exponents of ten that are multiples of three (e.g., 10^3 , 10^{-6} , 10^9). This is particularly useful in scientific and engineering calculations, where units of measure are often specified in multiples of three. See the prefix chart below.


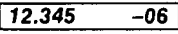
Multiplier	Prefix	Symbol
10^{12}	tera	T
10^9	giga	G
10^6	mega	M
10^3	kilo	k
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a


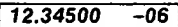
Engineering notation is selected by pressing  **ENG** followed by a number key. In engineering notation, the first three digits are always present, and the number key specifies the number of *additional* digits displayed after the first three. For example:

Press **Display**

0.000012345  0.000012345


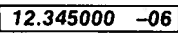
 **ENG** 0  12.3 -06 Engineering notation display. First three digits visible and power of 10 is the proper multiple of three.


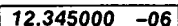
 **ENG** 2  12.345 -06 The number key specifies the number of digits displayed beyond the first three.


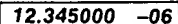
 **ENG** 4  12.34500 -06

Notice that because the first three digits are always present, the greatest number of additional digits that can be specified in engineering notation is five.

Press **Display**

 **ENG** 5  12.345000 -06 Maximum number of digits displayed.


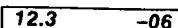
 **ENG** 6  12.345000 -06 No change in display.

 **ENG** 7  12.345000 -06 No change in display.

Rounding of displayed numbers in ENG 5 and ENG 6 is similar to the rounding of numbers in SCI 7 and SCI 8, discussed earlier. As with all display formats, engineering notation display does not affect the *actual* number as it is held internally by the calculator, but only alters the manner in which the number is displayed.

When engineering notation has been selected, the decimal point shifts to show the mantissa as units, tens, or hundreds in order to maintain the exponent of 10 as a multiple of three. For example, multiplying the number now in the calculator by 10 causes the decimal point to shift to the right without altering the exponent of 10:

Press **Display**

 **ENG** 0  12.3 -06

10   123. -06 Decimal point shifts. Power of 10 remains at 10⁻⁶.

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However, multiplying again by 10 causes the exponent to shift to another multiple of three and the decimal point to move to the units position:

Press	Display	
10 [x]	1.23 -03	Decimal point shifts. Power of 10 shifts to 10^{-3} .

Automatic Display Switching

The HP-25 switches the display from fixed point notation to full scientific notation (SCI 7) whenever the number is too large or too small to be seen with a fixed decimal point. This feature keeps you from missing unexpectedly large or small answers. For example, if you try to solve $(.05)^3$ in normal FIX 2 display, the answer is automatically shown in scientific notation:

Press	Display	
[CLX]	0.00 00	ENG 0 from previous example.
[0] [FIX] 2	0.00	Normal FIX 2 display.
.05 [ENTER]	0.05	
3 [0] [y^x]	1.250000 -04	Display automatically switched to SCI 7 to show answer.

Another way of displaying the answer would be 0.000125, but in normal FIX 2 display, you would have seen only **0.00** displayed.

After automatically switching from fixed to scientific, when a new number is keyed in or **[CLX]** is pressed the display automatically reverts back to the fixed point display originally selected.

The HP-25 also switches to scientific notation if the answer is too large ($>10^{10}$) for fixed point display. The display will not switch from fixed if you solve 1582000×1842 :

Press	Display	
1582000 [ENTER]	1582000.00	
1842 [x]	2914044000.	Fixed decimal point display.

However, if you multiply the result by 10, the answer is too large for fixed point notation, and switches automatically to scientific notation:

Press	Display
10 \times	2.9140440 10 Scientific notation display.

Notice that automatic switching is between fixed and scientific notation display modes only—engineering notation display must be selected from the keyboard.

Keying in Exponents of Ten

You can key in numbers multiplied by powers of 10 by pressing **EEX** (*enter exponent of ten*). For example, to key in 15.6 trillion (15.6×10^{12}), and multiply it by 25:

Press	Display
15.6	15.6
EEX	15.6 00
12	15.6 12 (This means 15.6×10^{12} .)

Now Press	Display
ENTER	1.5600000 13
25 \times	3.9000000 14

You can save time when keying in exact powers of 10 by merely pressing **EEX** and then pressing the desired power of 10. For example, key in 1 million (10^6) and divide by 52.

Press	Display
EEX	1. 00

You do not have to key in the number 1 before pressing **EEX** when the number is an exact power of 10.

6	1. 06
ENTER	1000000.00

Since you have not specified scientific notation, the answer reverts to fixed point notation when you press **ENTER**.

52 \div	19230.77
-----------	----------

To see your answer in scientific notation with six decimal places:

Press	Display
\square SCI 6	1.923077 04

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To key in negative exponents of 10, key in the number, press **EEEX**, press **CHS** to make the exponent negative, then key in the power of 10. For example, key in Planck's constant (h)—roughly, 6.625×10^{-27} erg sec.—and multiply it by 50.

Press	Display
CLX	0.000000 00
f FIX 2	0.00
6.625 EEEX	6.625 00
CHS	6.625 -00
27	6.625 -27
ENTER +	6.6250000 -27
50 x	3.3125000 -25 Erg sec.

Using the **EEEX** key, you can key in numbers made up of 10-digit mantissas and two-digit exponents of 10. However, when you use the **EEEX** key, the HP-25 displays each number as an eight-digit mantissa and a two-digit exponent of 10. In a few cases, a number may have to be altered slightly in form before you can key it in using the **EEEX** key:

- If you key in a number whose mantissa contains more than eight digits to the left of the decimal point, the **EEEX** key is overridden and does not operate. Begin again and key in the number in a form that displays the mantissa with eight digits or less to the left of the decimal point before pressing the **EEEX** key. (Thus, $123456789.1 \times 10^{23}$ could be keyed in as $12345678.91 \times 10^{24}$.)
- If you key in a number whose first significant digit occurs *after* the first eight digits of the display, the **EEEX** key does not operate upon that number. To key in the number correctly, begin again and place the number in a form such that its first significant digit is one of the first eight digits of the display, then proceed using the **EEEX** key. (Thus, $0000.000025 \times 10^{55}$ cannot be keyed in in that form. It could be keyed in as $0000.00025 \times 10^{54}$, or as 0.000025×10^{55} , for example.)

Calculator Overflow

When the number in the display would be greater than 9.9999999×10^{99} , the HP-25 displays all 9's to indicate that the problem has exceeded the calculator's range. For example, if you solve $(1 \times 10^{49}) \times (1 \times 10^{50})$, the HP-25 will display the answer:

Press	Display
EEX 49 ENTER ↑	1.0000000 49
EEX 50 ×	1.0000000 99

But if you attempt to multiply the above result by 100, the HP-25 display indicates overflow by showing you all 9's:

Press	Display
100 ×	9.9999999 99

A display of **OF** indicates that one of the calculator's *storage registers* has overflowed. See section 4, Function Keys, for a description of the HP-25 storage registers.

Error Display

If you happen to key in an improper operation, the word *Error* will appear in the display.

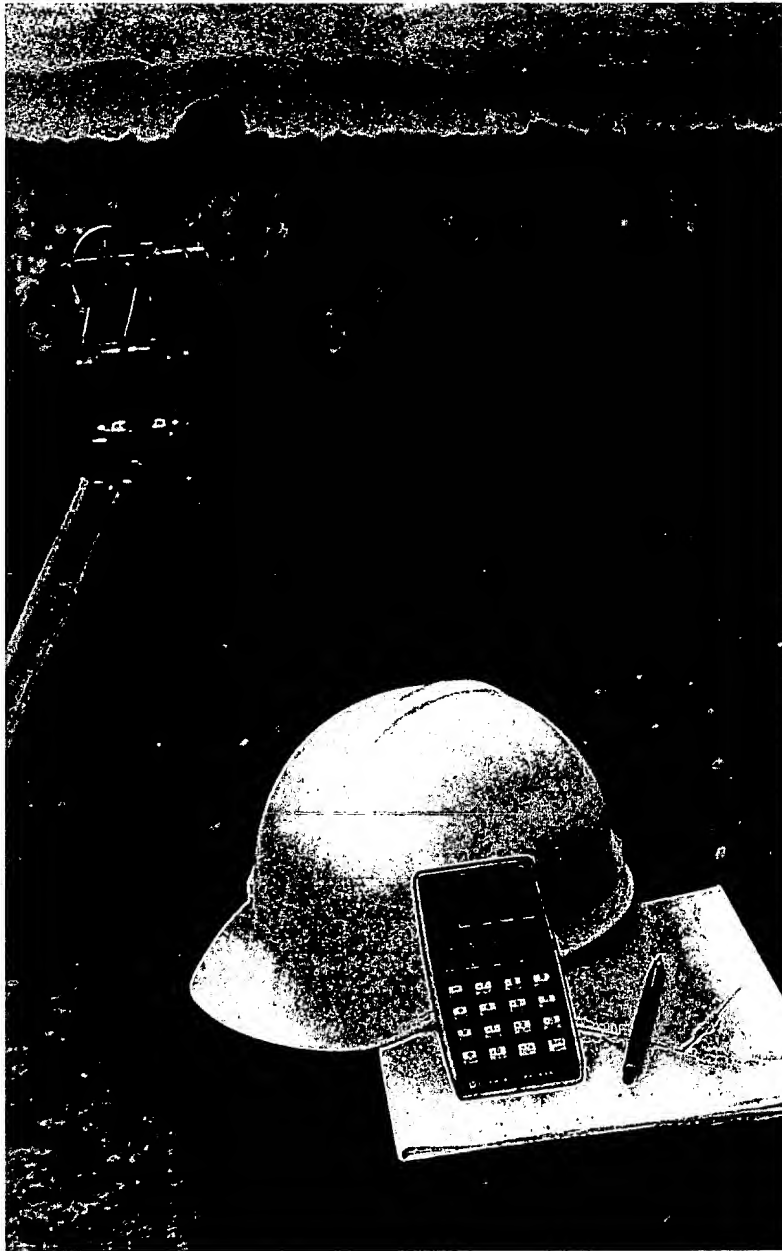
For example, try to divide 1 by 0 (the HP-25 will recognize this as an improper operation):

Press	Display
1 ENTER ↑	1.00
0 ÷	Error

You can clear the error by pressing **CLX** or by keying another number into the displayed X-register.

Press	Display
CLX	0.00

All those operations that cause **Error** to appear in the display are listed in appendix B.



Section 3

The Automatic Memory Stack

The Stack

Automatic storage of intermediate results is the reason that the HP-25 slides so easily through the most complex equations. And automatic storage is made possible by the Hewlett-Packard automatic memory stack.

Initial Display

When you first switch the calculator ON, the display shows 0.00. This represents the contents of the display, or X-register.

Basically, numbers are stored and manipulated in the machine "registers." Each number, no matter how few digits (e.g., 0, 1, or 5) or how many (e.g., 3.141592654, -23.28362, or $2.87148907 \times 10^{27}$), occupies one entire register.

The displayed X-register, which is the only visible register, is one of four registers inside the calculator that are positioned to form the automatic memory stack. We label these registers X, Y, Z, and T. They are "stacked" one on top of the other with the displayed X-register on the bottom. When the calculator is switched ON, these four registers are cleared to 0.00.

Name	Register	
T	0.00	Always displayed.
Z	0.00	
Y	0.00	
X	0.00	

Manipulating Stack Contents

The **R↓** (roll down) and **R↔Y** (x exchange y) keys allow you to review the stack contents or to shift data within the stack for computation at any time.

Reviewing the Stack

To see how the **R↓** key works, first load the stack with numbers 1 through 4 by pressing:

4 **ENTER** 3 **ENTER** 2 **ENTER** 1

The numbers that you keyed in are now loaded into the stack, and its contents look like this:

T	4.00
Z	3.00
Y	2.00
X	1.

Display

Each time you press the **R↓** key, the stack contents shift downward one register. So the last number that you have keyed in will be rotated around to the T-register when you press **R↓**.

When you press the **R↓** key, the stack contents are rotated . . .

. . . from this to this.	
T	4.00	T	1.00
Z	3.00	Z	4.00
Y	2.00	Y	3.00
X	1.	X	2.00

Display Display

Notice that the *contents* of the registers are shifted. The registers themselves maintain their positions. The contents of the X-register are always displayed, so 2.00 is now visible.

Press **R↓** again and the stack contents are shifted . . .

. . . from this to this.	
T	1.00	T	2.00
Z	4.00	Z	1.00
Y	3.00	Y	4.00
X	2.00	X	3.00

Display Display

Press **R↓** twice more . . . and the stack shifts . . .

. . . through this . . .

. . . back to the start again.

T	3.00
Z	2.00
Y	1.00
X	4.00

Display

T	4.00
Z	3.00
Y	2.00
X	1.00

Display

Once again the number 1.00 is in the displayed X-register. Now that you know how the stack is rotated, you can use the **R↓** key to review the contents of the stack at any time so that you can always tell what is in the calculator. Always remember, though, that it takes four presses of the **R↓** key to return the contents to their original registers.

Exchanging X and Y

The **x↔y** (*x exchange y*) key exchanges the contents of the X- and Y-registers without affecting the Z- and T-registers. If you press **x↔y** with data intact from the previous example, the numbers in the X- and Y-registers will be changed . . .

. . . from this . . .

T	4.00
Z	3.00
Y	2.00
X	1.00

. . . to this.

T	4.00
Z	3.00
Y	1.00
X	2.00

Similarly, pressing **x↔y** again will restore the numbers in the X- and Y-registers to their original places. This key is used to position numbers in the stack or simply to view the Y-register.

Clearing the Stack

To clear the displayed X-register only, press **CLX**. To clear the entire automatic memory stack, including the displayed X-register, press **0** **STK** (*clear stack*). This replaces all numbers in the stack with zeros. When you turn the calculator OFF, then ON, it “wakes up” with all zeros in the stack registers.

Although it may be comforting, *it is never necessary to clear the stack or the displayed X-register when starting a new calculation*. This will become obvious when you see how old results in the stack are automatically lifted by new entries.

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Press **CLX** now, and the stack contents are changed . . .

. . . from this . . .

T	4.00
Z	3.00
Y	1.00
X	2.00

Display

. . . to this.

T	4.00
Z	3.00
Y	1.00
X	0.00

Display

You can verify that only the X-register contents are affected by **CLX** by using the **R+** key to review the other stack contents.

If you press **7** **STK**, the contents of the stack are changed . . .

. . . from this . . .

T	4.00
Z	3.00
Y	1.00
X	0.00

Display

. . . to this.

T	0.00
Z	0.00
Y	0.00
X	0.00

Display

The **ENTER** Key

When you key a number into the calculator, its contents are written into the displayed X-register and the other registers remain unchanged. For example, if you keyed in the number 314.32, your stack registers would look like this:

Name	Register
T	0.00
Z	0.00
Y	0.00
X	314.32

Display

In order to key in a second number at this point, you must separate the digits of the first number from the digits of the second.

One way to separate numbers is to press **ENTER**. Press **ENTER** to change the contents of the registers . . .

. . . from this . . .

T	0.00
Z	0.00
Y	0.00
X	314.32

Display

. . . to this.

T	0.00
Z	0.00
Y	314.32
X	314.32

Display

As you can see, the number in the displayed X-register is copied into Y. (The numbers in Y and Z have also been transferred to Z and T, respectively, and the number in T has been lost off the top of the stack. But this will be more apparent when we have different numbers in all four registers.)

Immediately after pressing **ENTER**, the X-register is prepared for a new number, and that new number writes over the number in X. For example, key in the number 543.28 and the contents of the stack registers change. . .

. . . from this to this.	
T	0.00	T	0.00
Z	0.00	Z	0.00
Y	314.32	Y	314.32
X	314.32	X	543.28
		Display	

CLX replaces any number in the display with zero. Any new number then writes over the zero in X.

For example, if you had meant to key in 689.4 instead of 543.28, you would press **CLX** now to change the stack . . .

. . . from this to this.	
T	0.00	T	0.00
Z	0.00	Z	0.00
Y	314.32	Y	314.32
X	543.28	X	0.00
		Display	

and then key in 689.4 to change the stack . . .

. . . from this to this.	
T	0.00	T	0.00
Z	0.00	Z	0.00
Y	314.32	Y	314.32
X	0.00	X	689.4
		Display	

Notice that numbers in the stack do not move when a number is keyed in immediately after pressing **ENTER** or **CLX**. (However, the numbers in the stack *do* lift when a new number is keyed in immediately after pressing **R↓**.)

One-Number Functions and the Stack

One-number functions execute upon the number in the X-register only, and the contents of the Y-, Z-, and T-registers are unaffected when a one-number function key is pressed.

For example, with numbers positioned in the stack as in the earlier example, pressing the $\boxed{\text{f}} \boxed{\sqrt{x}}$ keys changes the stack contents . . .

. . . from this . . .

T	0.00
Z	0.00
Y	314.32
X	689.4

Display

. . . to this.

T	0.00
Z	0.00
Y	314.32
X	26.26

Display

The one-number function executes upon only the number in the displayed X-register, and the answer writes over the number that was in the X-register. No other register is affected by a one-number function.

Two-Number Functions and the Stack

Hewlett-Packard calculators do arithmetic by positioning the numbers in the stack the same way you would on paper. For instance, if you wanted to add 34 and 21 you would write 34 on a piece of paper and then write 21 underneath it, like this:

$$\begin{array}{r} 34 \\ 21 \\ \hline \end{array}$$

and then you would add, like this:

$$\begin{array}{r} 34 \\ +21 \\ \hline 55 \end{array}$$

Numbers are positioned the same way in the HP-25. Here's how it is done. (If you clear the previous number entries first by pressing $\boxed{\text{f}} \boxed{\text{STK}}$ the numbers in the stack will correspond to those shown in the example below.)

Press	Display	
34	34.	34 is keyed into X.
ENTER	34.00	34 is copied into Y.
21	21.	21 writes over the 34 in X.

Now 34 and 21 are sitting vertically in the stack as shown below, so we can add.

T	0.00
Z	0.00
Y	34.00
X	21.

Display

Press	Display	
+	55.00	The answer.

The simple, old-fashioned math notation helps explain how to use your calculator. Both numbers are always positioned in the stack in the natural order first; then the operation is executed when the function key is pressed. *There are no exceptions to this rule.* Subtraction, multiplication, and division work the same way. In each case, the data must be in the proper position before the operation can be performed.

To subtract 21 from 34:

$$\begin{array}{r} 34 \\ -21 \\ \hline \end{array}$$

Press	Display	
34	34.	34 is keyed into X.
ENTER	34.00	34 is copied into Y.
21	21.	21 writes over the 34 in X.
=	13.00	The answer.

To multiply 34 by 21:

$$\begin{array}{r} 34 \\ \times 21 \\ \hline \end{array}$$

Press	Display	
34	34.	34 is keyed into X.
ENTER	34.00	34 is copied into Y.
21	21.	21 writes over the 34 in X.
x	714.00	The answer.

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To divide 34 by 21:

$$\begin{array}{r} 34 \\ 21 \end{array}$$

Press	Display	
34	<div>34.</div>	34 is keyed into X.
ENTER	<div>34.00</div>	34 is copied into Y.
21	<div>21.</div>	21 writes over the 34 in X.
÷	<div>1.62</div>	The answer.

Chain Arithmetic

You've already learned how to key numbers into the calculator and perform calculations with them. In each case you first needed to position the numbers in the stack manually using the **ENTER** key. However, the stack also performs many movements automatically. These automatic movements add to its computing efficiency and ease of use, and it is these movements that automatically store intermediate results. The stack automatically "lifts" every calculated number in the stack when a new number is keyed in because it *knows* that after it completes a calculation, any new digits you key in are a part of a new number. Also, the stack automatically "drops" when you perform a two-number operation. For example, calculate $16 + 30 + 11 + 17 = ?$

Note: If you press **1** **STK** first, you will begin with zeros in all of the stack registers, as the example below.

Press	Stack Contents	
	T <div>0.00</div>	
	Z <div>0.00</div>	
16	Y <div>0.00</div>	
	X <div>16.</div>	16 is keyed into the displayed X-register.
	T <div>0.00</div>	
	Z <div>0.00</div>	
ENTER	Y <div>16.00</div>	
	X <div>16.00</div>	16 is copied into Y.

30	T	0.00	30 writes over the 16 in X.
	Z	0.00	
	Y	16.00	
	X	30.	
+	T	0.00	16 and 30 are added together. The answer, 46, is displayed.
	Z	0.00	
	Y	0.00	
	X	46.00	
11	T	0.00	11 is keyed into the displayed X-register. The 46 in the stack is automatically raised.
	Z	0.00	
	Y	46.00	
	X	11.	
+	T	0.00	46 and 11 are added together. The answer, 57, is displayed.
	Z	0.00	
	Y	0.00	
	X	57.00	
17	T	0.00	17 is keyed into the X-register. 57 is automatically entered into Y.
	Z	0.00	
	Y	57.00	
	X	17.00	
+	T	0.00	57 and 17 are added together for the final answer.
	Z	0.00	
	Y	0.00	
	X	74.00	

After any calculation or number manipulation, the stack automatically lifts when a new number is keyed in. Because operations are performed when the operations are pressed, the length of such chain problems is unlimited unless a number in one of the stack registers exceeds the range of the calculator (up to $9.99999999 \times 10^{99}$).

In addition to the automatic stack lift after a calculation, the stack automatically drops *during* calculations involving both

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the X- and Y-registers. It happened in the above example, but let's do the problems differently to see this feature more clearly.

First press **CLX** to clear the X-register. Now, again solve $16 + 30 + 11 + 17 = ?$

Press	Stack Contents		
16	T	0.00	16 is keyed into the displayed X-register.
	Z	0.00	
	Y	0.00	
	X	16.	
ENTER ↓	T	0.00	16 is copied into Y.
	Z	0.00	
	Y	16.00	
	X	16.00	
30	T	0.00	30 is written over the 16 in X.
	Z	0.00	
	Y	16.00	
	X	30.	
ENTER ↓	T	0.00	30 is entered into Y. 16 is lifted up to Z.
	Z	16.00	
	Y	30.00	
	X	30.00	
11	T	0.00	11 is keyed into the displayed register.
	Z	16.00	
	Y	30.00	
	X	11.	
ENTER ↓	T	16.00	11 is copied into Y. 16 and 30 are lifted up to T and Z respectively.
	Z	30.00	
	Y	11.00	
	X	11.00	
17	T	16.00	17 is written over the 11 in X.
	Z	30.00	
	Y	11.00	
	X	17.	

+	T	16.00	17 and 11 are added together and the rest of the stack drops. 16 drops to Z and is also duplicated in T. 30 and 28 are ready to be added.
	Z	16.00	
	Y	30.00	
	X	28.00	
+	T	16.00	30 and 28 are added together and the stack drops again. Now 16 and 58 are ready to be added.
	Z	16.00	
	Y	16.00	
	X	58.00	
+	T	16.00	16 and 58 are added together for the final answer and the stack continues to drop.
	Z	16.00	
	Y	16.00	
	X	74.00	

The same dropping action also occurs with \square , \boxtimes and \div . The number in T is duplicated in T and Z, the number in Z *drops* to Y, and the numbers in Y and X *combine* to give the answer, which is visible in the X-register.

This automatic lift and drop of the stack give you tremendous computing power, since you can retain and position intermediate results in long calculations without the necessity of reentering the numbers.

Order of Execution

When you see a problem like this one:

$$5 \times [(3 \div 4) - (5 \div 2) + (4 \times 3)] \div (3 \times .213),$$

you must decide where to begin before you ever press a key.

Hewlett-Packard applications engineers have determined that by starting *every* problem at its innermost number or parentheses and working outward, you maximize the efficiency and power of your HP calculator. Of course, with the HP-25 you have tremendous versatility in the order of execution.

For example, you *could* work the problem above by beginning at the left side of the equation and simply working through it in left-to-right order. All problems cannot be solved using left-to-right order, however, and the *best* order for solving any problem is to begin with the innermost parentheses and work outward. So, to solve the problem above:

Press	Display	
3	3.	
ENTER	3.00	
4	4.	
÷	0.75	Intermediate answer for $(3 \div 4)$.
5	5.	
ENTER	5.00	
2	2.	
÷	2.50	Intermediate answer for $(5 \div 2)$.
-	-1.75	Intermediate answer for $(3 \div 4) - (5 \div 2)$.
4	4.	
ENTER	4.00	
3	3.	
×	12.00	Intermediate answer for (4×3)
+	10.25	Intermediate answer for $(3 \div 4) - (5 \div 2) + (4 \times 3)$.
3	3.	
ENTER	3.00	
.213	0.213	
×	0.64	Intermediate answer for $(3 \times .213)$.
÷	16.04	
5	5.	The first number is keyed in.
×	80.20	The final answer.

Constant Arithmetic

You may have noticed that whenever the stack drops because of a two-number operation (not because of **R↓**), the number in the T-register is reproduced there. This stack operation can be used to insert a constant into a problem.

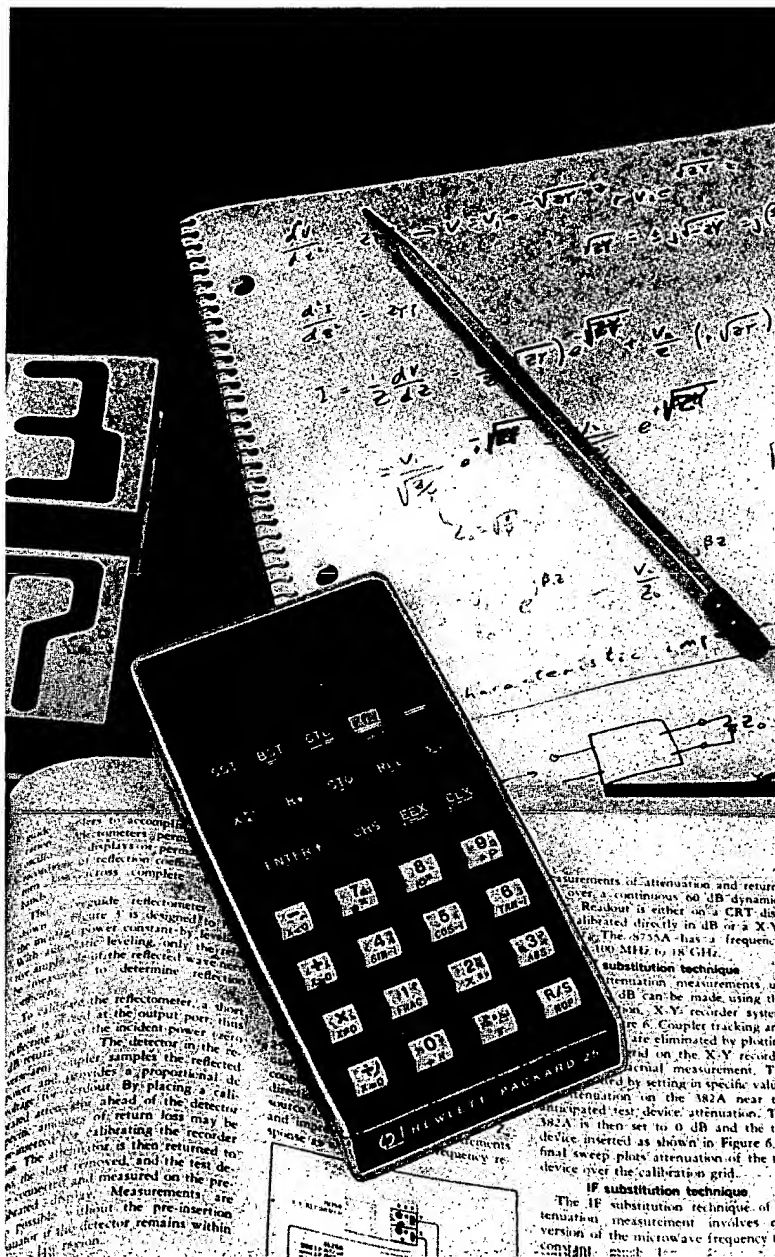
Example: A bacteriologist tests a certain strain whose population typically increases by 15% each day. If he starts a sample culture of 1000, what will be the bacteria population at the end of each day for six consecutive days?

Method: Put the growth factor (1.15) in the Y-, Z-, and T-registers and put the original population (1000) in the X-register. Thereafter, you get the new population whenever you press $\boxed{\times}$.


Press	Display	
1.15	$\boxed{1.15}$	Growth factor.
$\boxed{\text{ENTER} \blacktriangleright}$	$\boxed{1.15}$	
$\boxed{\text{ENTER} \blacktriangleright}$	$\boxed{1.15}$	
$\boxed{\text{ENTER} \blacktriangleright}$	$\boxed{1.15}$	Growth factor now in T.
1000	$\boxed{1000.}$	Starting population.
$\boxed{\times}$	$\boxed{1150.00}$	Population after 1st day.
$\boxed{\times}$	$\boxed{1322.50}$	Population after 2nd day.
$\boxed{\times}$	$\boxed{1520.88}$	Population after 3rd day.
$\boxed{\times}$	$\boxed{1749.01}$	Population after 4th day.
$\boxed{\times}$	$\boxed{2011.36}$	Population after 5th day.
$\boxed{\times}$	$\boxed{2313.06}$	Population after 6th day.

When you press $\boxed{\times}$ the first time, you calculate 1.15×1000 . The result (1150.00) is displayed in the X-register and a new copy of the growth factor drops into the Y-register. Since a new copy of the growth factor is duplicated from the T-register each time the stack drops, you never have to reenter it.


Notice that performing a two-number operation such as $\boxed{\times}$ causes the number in the T-register to be duplicated each time the stack is dropped. However, the $\boxed{\text{R} \blacktriangleright}$ key, since it *rotates* the contents of the stack registers, does not *rewrite* any number, but merely shifts the numbers that are already in the stack.




Function Keys

The HP-25 function keys can be used manually or keyed in as part of a program. In this section, each key is individually explained. To use function keys manually, ensure that the PRGM-RUN switch  is set to RUN.

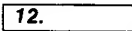





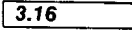

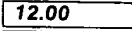


LAST X

In addition to the four stack registers that automatically store intermediate results, the HP-25 also contains a separate automatic register, the LAST X register. This register preserves the value that was in the displayed X-register before the performance of a function. To place the contents of the LAST X register into the display again, press  **LAST X**.

Recovering from Mistakes

 makes it easy to recover from keystroke mistakes, such as pressing the wrong function key or keying in the wrong number.

Example: Divide 12 by 2.157 after you have mistakenly divided by 3.157.

Press	Display	
12	 12.	
	 12.00	
3.157 	 3.80	Oops! You made a mistake.
 LAST X	 3.16	Retrieves that last entry.
	 12.00	You're back at the beginning.
2.157 	 5.56	The correct answer.

In the above example, when you pressed **f** **LAST X**, the contents of the stack and LAST X registers were changed . . .

. . . from this . . .

T	0.00	
Z	0.00	
Y	0.00	LAST X
X	3.80	3.16

. . . to this.

T	0.00	
Z	0.00	
Y	3.80	LAST X
X	3.16	← 3.16

This made possible the correction illustrated in the example above.

Recovering a Number

The LAST X register is useful in calculations where a number occurs more than once. By recovering a number using **f** **LAST X**, you do not have to key that number into the calculator again.

Example: Calculate

$$\begin{array}{r} 7.32 + 3.650112331 \\ \hline 3.650112331 \end{array}$$

Press	Display
7.32	7.32
ENTER	7.32
3.650112331	3.650112331
+	10.97
f LAST X	3.65
+	3.01

Intermediate answer.

Recalls 3.650112331 to X-register.

The answer.

Prefix Clear

The **PREFIX** (clear prefix) key will clear a blue **g** prefix key, a gold **f** prefix key, **STO**, **RCL**, or **GTO** (**GTO** is explained in section 5, Programming). To clear a prefix you have mistakenly pressed, merely press **f** **PREFIX** as the next keystrokes, then press the correct key. For example, to change a blue prefix keystroke to that of another key during a calculation:

Press	Display
2 g	2.

Oops! You meant to change the sign of the number in the display, but you pressed the blue prefix key by mistake.

f PREFIX	2.00
CHS	-2.00

Clears the blue prefix keystroke.

The correct operation, change sign, is performed.

Number Alteration Keys

Besides **CHS** there are three keys provided on the HP-25 for altering numbers. These keys are **ABS**, **FRAC** and **INT**, and they are most useful when performing operations as part of a program.

Absolute Value

Some calculations require the absolute value, or magnitude, of a number. To obtain the absolute value of the number in the display, press the **g** prefix key followed by the **ABS** (*absolute value*) key. For example, to calculate the absolute value of -3:

Press	Display
3 CHS	-3.
g ABS	3.00 -3

To see the absolute value of +3:

Press	Display
g ABS	3.00 +3

Integer Portion of a Number

To extract and display the integer portion of a number, press the **f** prefix key followed by the **INT** (*integer*) key. For example, to display only the integers of the number 123.456:

Press	Display
123.456	123.456
f INT	123.00

Only the integer portion of the number remains.

When **f** **INT** is pressed, the fractional portion of the number is lost. The entire number, of course, is preserved in the LAST X register.

Fractional Portion of a Number

To place only the fractional portion of a number into the displayed X-register, press the **g** prefix key followed by the

FRAC (*fraction*) key. For example, to see the fractional portion of 123.456 used above:

Press	Display
123.456	123.456
g FRAC	0.46

Only the fractional portion of the number is displayed, rounded here to normal FIX 2 display.

When **g** **FRAC** is pressed, the integer portion of the number is lost. The entire number, of course, is preserved in the LAST X register.

Reciprocals

To calculate the reciprocal of a number in the displayed X-register, then press **g** $\frac{1}{x}$. For example, to calculate the reciprocal of 25:

Press	Display
25 g $\frac{1}{x}$	0.04

You can also calculate the reciprocal of a value in a previous calculation without reentering the number. For example, to calculate

$$\frac{1}{1/3 + 1/6}$$

Press	Display	
3 g $\frac{1}{x}$	0.33	Reciprocal of 3.
6 g $\frac{1}{x}$	0.17	Reciprocal of 6.
+	0.50	Sum of reciprocals.
g $\frac{1}{x}$	2.00	Reciprocal of sum.

Square Roots

To calculate the square root of a number in the displayed X-register, press **f** \sqrt{x} . For example, to find the square root of 16:

Press	Display
16 f \sqrt{x}	4.00

To find the square root of the result:

Press	Display
f \sqrt{x}	2.00

Squaring

To square a number in the displayed X-register, press **g** **x²**. For example, to find the square of 45:

Press	Display
45 g x²	2025.00

To find the square of the result:

Press	Display
g x²	4100625.00

Using Pi

The value π accurate to 10 places (3.141592654) is provided as a fixed constant in the HP-25. Merely press **g** **π** whenever you need it in a calculation. For example, to calculate 3π :

Press	Display
3 g π x	9.42

Example: Trencherman Buck Mulligan looks into a recent edition of the *Guinness Book of Records* and finds that the largest pizza ever baked had a diameter of 21 feet. If his appetite were equal to the task, how many square feet of pizza would Mulligan have to devour in order to consume all of the world's largest pizza?

$$\text{Area} = \pi \left(\frac{d}{2} \right)^2 = \pi \left(\frac{21}{2} \right)^2$$

Press	Display	
21 ENTER	21.00	
2 ÷	10.50	
g x²	110.25	
g π	3.14	
x	346.36	Square feet of pizza.

Pressing **g** **π** causes the results in the automatic memory stack to lift.

Percentages

The $\boxed{\%}$ key is a two-number function that allows you to compute percentages. To find the percentage of a number;

1. Key in the base number.
2. Press $\boxed{\text{ENTER}}$.
3. Key in the number representing percent rate.
4. Press $\boxed{g} \boxed{\%}$.

For example, to calculate a sales tax of 6.5% on a purchase of \$1500:

Press	Display	
1500 $\boxed{\text{ENTER}}$	$\boxed{1500.00}$	Base number.
6.5	$\boxed{6.5}$	Percent rate.
$\boxed{g} \boxed{\%}$	$\boxed{97.50}$	The answer.

6.5% of \$1500 is \$97.50.

In the above example, when the $\boxed{g} \boxed{\%}$ keys are pressed, the calculated answer writes over the percentage rate in the X-register, and the base number is preserved in the Y-register.

When you pressed $\boxed{g} \boxed{\%}$, the stack contents were changed . . .

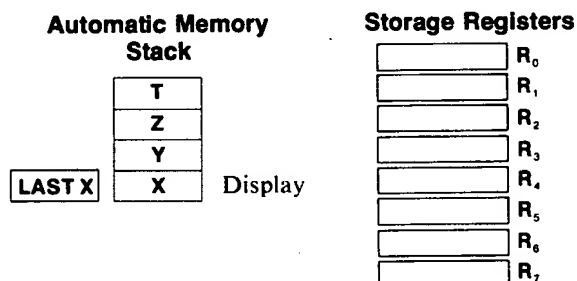
. . . from this to this.
T $\boxed{0.00}$	T $\boxed{0.00}$
Z $\boxed{0.00}$	Z $\boxed{0.00}$
Y $\boxed{1500.00}$	Y $\boxed{1500.00}$
X $\boxed{6.5}$	X $\boxed{97.50}$

Since the purchase price is now in the Y-register and the amount of tax is in the X-register, the total amount can be obtained by simply adding:

Press	Display	
$\boxed{+}$	$\boxed{1597.50}$	Total of price and sales tax combined.

Storage Registers

In addition to automatic storage of intermediate results that is provided by the four-register automatic memory stack, the HP-25 also has eight addressable storage registers that are unaffected by operations within the stack. These storage registers allow you to set aside numbers as constants or for use in later calculations, and they can be used either manually or as part of a program.



The addresses of the storage registers are indicated by number keys [0] through [7], as shown above.

Storing and Recalling Data

To store a value appearing in the display, press **STO** (*store*) followed by a number key ([0] through [7]) specifying the register address where the value is to be stored. For example, to store Avogadro's number (approximately 6.02×10^{23}) in register R₂:

Press		Display	
6.02 EE 23		6.02 23	
STO 2		6.020000 23	The number is now stored in register R ₂ .

When a number is stored, it is merely *copied* into the storage register, so 6.02×10^{23} also remains in the displayed X-register.

To copy a number from one of the storage registers into the display, press the **RCL** (*recall*) key followed by the number key of the register address.

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For example, to recall Avogadro's number:

Press	Display
CLX	0.00
RCL 2	6.020000 23

Recalling a number causes the stack to lift unless the preceding keystroke was **ENTER**, **CLX** or **$\Sigma+$** (more about **$\Sigma+$** later).

When you recall a number, it is copied from the storage register into the display, and it also remains in the storage register. You can recall a number from a storage register any number of times without altering it—the number will remain in the storage register as a 10-digit number with a two-digit exponent of 10 until you overwrite it by storing another number there, or until you clear the storage registers.

Example: Three tanks have capacities in U.S. units of 2.0, 14.4, and 55.0 gallons, respectively. If one U.S. gallon is approximately equal to 3.785 liters, what is the capacity of each of the tanks?

Method: Place the conversion constant in one of the storage registers and bring it out as required.

Press	Display	
CLX	0.00	
f FIX 3	0.000	Display mode set.
3.785 STO 0	3.785	Constant placed in register R_0 .
2 x	7.570	Capacity of 1st tank in liters.
14.4 RCL 0 x	54.504	Capacity of 2nd tank in liters.
55 RCL 0 x	208.175	Capacity of 3rd tank in liters.
f FIX 2	208.18	Display mode reset.

Clearing Storage Registers

To clear the number from a single storage register, simply store the quantity zero in the register by pressing **0** **STO** followed by the number key (**0** through **7**) of the register address.

To clear data from *all* manual storage registers at once, without affecting data in other portions of the calculator, press **f** **REG**. This places zero in all eight of the storage registers. Of course, turning the calculator OFF also clears all registers.

Storage Register Arithmetic

Arithmetic is performed *upon the contents of the storage register* by pressing **STO** followed by the arithmetic function key followed in turn by the register address. For example:

Press	Result
STO + 1	Number in displayed X-register added to contents of storage register R_1 , and sum placed into R_1 : ($r_1 + x \rightarrow R_1$).
STO - 2	Number in displayed X-register subtracted from contents of storage register R_2 , and difference placed into R_2 : ($r_2 - x \rightarrow R_2$).
STO x 3	Number in displayed X-register multiplied by contents of storage register R_3 , and the product placed into R_3 : [$(r_3) \times \rightarrow R_3$].
STO ÷ 4	Contents of storage register R_4 divided by number in displayed X-register, and quotient placed into R_4 : ($r_4 \div x \rightarrow R_4$).

When storage register arithmetic operations are performed, the answer is written into the selected storage register, while the contents of the displayed X-register and the rest of the stack remain unchanged.

Example: During harvest, a farmer trucks tomatoes to the cannery for three days. On Monday and Tuesday he hauls loads of 25 tons, 27 tons, 19 tons, and 23 tons, for which the cannery pays him \$55 per ton. On Wednesday the price rises to \$57.50 per ton, and he ships loads of 26 tons and 28 tons. If the cannery deducts 2% of the price on Monday and Tuesday because of blight on the tomatoes, and 3% of the price on Wednesday, what is the farmer's total net income?

Method: Keep total amount in a storage register while using the stack to add tonnages and calculate amounts of loss.

Press	Display	
25 ENTER 27 +		
19 + 23 +	94.00	Total of Monday's and Tuesday's tonnage.
55 x	5170.00	Gross amount for Monday and Tuesday.

58 Function Keys

STO 5	5170.00	Gross placed in storage register R_5 .
2 9 %	103.40	Deductions for Monday and Tuesday.
STO - 5	103.40	Deductions subtracted from total in storage register R_5 .
26 ENTER 28 +	54.00	Wednesday's tonnage.
57.50 x	3105.00	Gross amount for Wednesday.
STO + 5	3105.00	Wednesday's gross amount added to total in storage register R_5 .
3 9 %	93.15	Deduction for Wednesday.
STO - 5	93.15	Wednesday deduction subtracted from total in storage register R_5 .
RCL 5	8078.45	The farmer's total net income from his tomatoes.

(You could also work this problem using the stack alone, but it illustrates how storage register arithmetic works.)

Storage Register Overflow

If the magnitude of a number in any of the eight storage registers exceeds $9.99999999 \times 10^{99}$, the HP-25 display immediately shows **OF** (overflow) to indicate that a storage register has overflowed.

For example, if you use storage register arithmetic to attempt to calculate the product of 1×10^{50} and 7.5×10^{50} in register R_0 , the register overflows and the display shows **OF**. To see the result of storage register overflow:

Press	Display	
EEX 50	1. 50	
STO 0	1.000000 50	1×10^{50} placed into storage register R_0 .
7.5 EEX 50	7.5 50	
STO x 0	OF	When you multiplied using storage register arithmetic, register R_0 overflowed.

To clear a storage register overflow display, merely press

CLX.

Trigonometric Functions

Your HP-25 provides you with six trigonometric functions. It also calculates angles in decimal degrees, radians, or grads; and it converts between decimal degrees and degrees, minutes, seconds.

Trigonometric Modes

When the HP-25 is first turned ON, it “wakes up” with angles specified in decimal degrees. To set radians or grads mode, press the **9** shift key followed by either **RAD** (*radians*) or **GRD** (*grads*). To switch back to the decimal degrees mode again, press the **9** shift key followed by the **DEG** (*degrees*) key.

Note: 360 degrees = 2π radians = 400 grads

Functions

The six trigonometric functions provided by the calculator are:

- f** **SIN** (sine)
- 9** **SIN⁻¹** (arc sine)
- f** **COS** (cosine)
- 9** **COS⁻¹** (arc cosine)
- f** **TAN** (tangent)
- 9** **TAN⁻¹** (arc tangent)

Each trigonometric function assumes angles in decimal degrees, radians, or grads. Trigonometric functions are one-number functions, so to use them you key in the number, then press the function keys.

Example 1: Find the cosine of 35°.

Press	Display	
35	35.	Calculator “wakes up” in decimal degrees mode.
f COS	0.82	The answer.

Example 2: Find the arc sine in grads of .964.

Press	Display	
.964	0.964	
9 GRD	0.96	Grads mode is set.
9 SIN⁻¹	82.87	Grads.

Hours, Minutes, Seconds

The $\boxed{\rightarrow H.MS}$ (to hours, minutes, seconds) key converts decimal hours to the format of hours, minutes and seconds. To see the digits for *seconds*, you should specify FIX 4 display format. For example, to convert 12.56 hours to hours, minutes, seconds:

Press	Display	
12.56	$\boxed{12.56}$	Decimal hours.
\boxed{f} \boxed{FIX} 4	$\boxed{12.5600}$	Sets display format.
\boxed{f} $\boxed{\rightarrow H.MS}$	$\boxed{12.3336}$	This is read as 12 hours, 33 minutes, 36 seconds.

Conversely, the $\boxed{\rightarrow H}$ (to decimal hours) key is used to change hours, minutes, seconds into decimal hours. For example, to convert 12 hours, 33 minutes, 36 seconds back into decimal hours:

Press	Display	
$\boxed{9}$ $\boxed{\rightarrow H}$	$\boxed{12.5600}$	Decimal hours.

Hours to hours, minutes, seconds conversion is accurate to 10^{-5} decimal hours.

The $\boxed{\rightarrow H}$ and $\boxed{\rightarrow H.MS}$ keys also permit you to change degrees, minutes, seconds to decimal degrees, and vice versa.

For example, to change $137^{\circ}45'12''$ to decimal degrees:

Press	Display	
137.4512	$\boxed{137.4512}$	
$\boxed{9}$ $\boxed{\rightarrow H}$	$\boxed{137.7533}$	Decimal degrees.

The conversion is important because trigonometric functions in the HP-25 operate on angles in *decimal degrees*, but not in *degrees, minutes, seconds*. In order to calculate any trigonometric functions of an angle given in degrees, minutes, seconds, you must first convert the angle to decimal degrees.

Example: Lovesick sailor Oscar Odysseus dwells on the island of Tristan da Cunha ($37^{\circ}03' S$, $12^{\circ}18' W$), and his sweetheart, Penelope, lives on the nearest island. Unfortunately for the course of true love, however, Tristan da Cunha is the most isolated inhabited spot in the world. If Penelope lives on the island of St. Helena ($15^{\circ}55' S$, $5^{\circ}43' W$), use the following

formula to calculate the great circle distance that Odysseus must sail in order to court her.

$$\text{Distance} = \cos^{-1} \left[\sin(\text{LAT}_s) \sin(\text{LAT}_d) + \cos(\text{LAT}_s) \cos(\text{LAT}_d) \cos(\text{LNG}_d - \text{LNG}_s) \right] \times 60.$$

Where LAT_s and LNG_s = latitude and longitude of the source (Tristan da Cunha).

LAT_d and LNG_d = latitude and longitude of the destination.

Solution: Convert all degrees, minutes, seconds entries into decimal degrees as you key them in. The equation for the great circle distance from Tristan da Cunha to the nearest inhabited land is:

$$\text{Distance} = \cos^{-1} \left[\sin(37^\circ 03') \sin(15^\circ 55') + \cos(37^\circ 03') \cos(15^\circ 55') \cos(5^\circ 43' \text{W} - 12^\circ 18' \text{W}) \right] \times 60$$

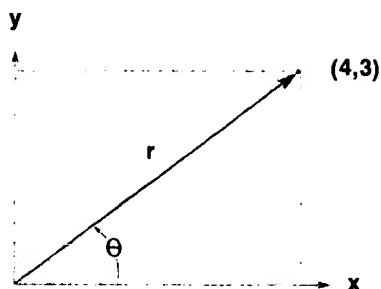
Press	Display	
f FIX 2	0.00	Display mode is set. (Assumes no results remain from previous example.)
g DEG	0.00	Sets decimal degree mode for trigonometric functions.
5.43 g ⇨H	5.72	
12.18 g ⇨H −	−6.58	
f cos	0.99	
15.55 g ⇨H STO 1	15.92	
f cos	0.96	
x	0.96	
37.03 g ⇨H STO 0	37.05	
f cos	0.80	
x	0.76	
RCL 0 f sin	0.60	
RCL 1 f sin	0.27	
x	0.17	
+	0.93	
g cos^{−1}	21.92	
60 x	1315.41	Distance in nautical miles that Odysseus must sail to visit Penelope.

Polar/Rectangular Coordinate Conversion

Two functions are provided for polar/rectangular coordinate conversion. To convert values in the X- and Y-registers, (representing rectangular x , y coordinates, respectively) to polar r , θ coordinates (magnitude and angle, respectively), press **9** **→P**. Magnitude r then appears in the X-register and angle is placed in the Y-register.

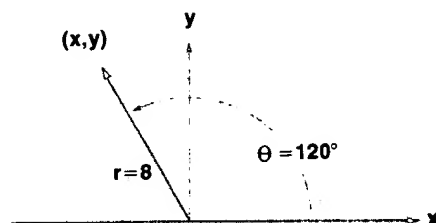
Conversely, to convert values in the X- and Y-registers (representing polar r , θ , respectively) to rectangular coordinates (x , y respectively), press **1** **→R**.

Example 1: Convert rectangular coordinates (4,3) to polar form with the angle expressed in radians.



Press	Display	
9 RAD	0.00	Specifies radians mode. (Assumes no results remain from previous example.)
3 ENTER 4	4.	Rectangular coordinates placed in X- and Y-registers.
9 →P	5.00	Magnitude r .
X↔Y	0.64	Angle θ in radians.

Example 2: Convert polar coordinates $(8, 120^\circ)$ to rectangular coordinates.



Press	Display	
[DEG]	0.00	Specifies degrees mode. (Assumes no results remain from previous example.)
120 [ENTER] 8	8.	Polar coordinates θ and r placed in Y- and X-registers, respectively.
[X] [R]	-4.00	x-coordinate.
[X] [Y]	6.93	y-coordinate.

Logarithmic and Exponential Functions

Logarithms

The HP-25 computes both natural and common logarithms as well as their inverse functions (antilogarithms):

- [ln] is \log_e (natural log). It takes the log of the value in the X-register to base e (2.718 . . .).
- [e^x] is antilog_e (natural antilog). It raises e (2.718 . . .) to the power of the value in X-register. (To display the value of e , press [e^x] .)
- [log] is \log_{10} (common log). It computes the log of the value in the X-register to base 10.
- [10^x] is antilog_{10} (common antilog). It raises 10 to the power of the value in the X-register.

Example 1: The 1906 San Francisco earthquake, with a magnitude of 8.25 on the Richter Scale is estimated to be 105 times greater than the Nicaragua quake of 1972. What would be the magnitude of the latter on the Richter Scale? The equation is

$$R_1 = R_2 - \log \frac{M_2}{M_1} = 8.25 - \left(\log \frac{105}{1} \right)$$

Solution:**Press****Display**8.25 **ENTER**+

8.25

105 **1/x** **log**

2.02

=

6.23

Rating on Richter scale.

Example 2: Ace explorer Jason Quarmorte is using an ordinary barometer as an altimeter. After measuring the sea level pressure (30 inches of mercury) he climbs until the barometer indicates 9.4 inches of mercury. Although the exact relationship of pressure and altitude is a function of many factors, Quarmorte knows that an *approximation* is given by the formula:

$$\text{Altitude (feet)} = 25,000 \ln \frac{30}{\text{Pressure}} = 25,000 \ln \frac{30}{9.4}$$

Where is Jason Quarmorte?

Solution:**Press****Display**30 **ENTER**+

30.00

9.4 **÷**

3.19

1/x **ln**

1.16

25000

25000.

×

29072.19

Altitude in feet.

Quarmorte is probably near the summit of Mount Everest (29,028 ft).

Raising Numbers to Powers

$\frac{1}{x}$ y^x permits you to raise a positive number (either an integer or a decimal) to any power. For example, calculate 2^9 (i.e., $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$).

Press**Display**2 **ENTER** 9 **1/x** y^x

512.00

Now find $8^{-1.2567}$.**Press****Display**8 **ENTER**+

8.00

1.2567 **CHS** **1/x** y^x

0.07

In conjunction with **$\frac{1}{x}$** , **$\frac{1}{x}$ y^x** provides a simple way to extract roots. For example, find the cube root of 5 (This is equivalent to $5^{1/3}$).

Press	Display
5 ENTER	5.00
3 g $\frac{1}{x}$	0.33 Reciprocal of 3.
f y^x	1.71 Cube root of 5.

Example: An aircraft pilot reads a pressure altitude (PALT) of 25,500 feet with a calibrated airspeed (CAS) of 350 knots. What is the flight mach number

$$M = \frac{\text{speed of aircraft}}{\text{speed of sound}}$$

if the following formula is applicable?

M =

$$\sqrt[5]{\left[\left(\left[\left(1 + 0.2 \left[\frac{350}{661.5}\right]^2\right)^{3.5} - 1\right] \left[1 - \left(6.875 \times 10^{-6}\right) 25,500\right]^{-5.2656}\right\} + 1\right)^{0.286} - 1}$$

Method: The most efficient place to begin work on this problem is at the innermost set of brackets. So begin by solving for the

quantity $\left[\frac{350}{661.5}\right]^2$ and proceed outward from there.

Press	Display
350 ENTER 661.5 ÷	0.53
g x^2	0.28 Square of bracketed quantity.
.2 × 1 +	1.06
3.5 f y^x 1 −	0.21 Contents of left-hand set of brackets are in the stack.
1 ENTER 6.875 EEX	6.875 00
CHS 6 ENTER	6.8750000 -06
25500 × −	0.82
5.2656 CHS f y^x	2.76 Contents of right-hand set of brackets are in the stack.
× 1 +	1.58
.286 f y^x 1 −	0.14
5 × f \sqrt{x}	0.84 Mach number of the flight.

In working through complex equations, like the one containing six levels of parentheses above, you really appreciate the value of the Hewlett-Packard logic system. Because you calculate one step at a time, you don't get "lost" within the problem. You see every intermediate result, and you emerge from the calculation confident of your final answer.

Statistical Functions

Summations

Pressing the $\Sigma+$ key automatically gives you several different sums and products of the values in the X- and Y- registers at once. In order to make these values accessible for sophisticated statistics problems, they are automatically placed by the calculator into storage registers R_3 through R_7 . *The only time that information is automatically accumulated in the storage registers is when the $\Sigma+$ key is used.* Before you begin any calculations using the $\Sigma+$ key, you should first clear the storage registers of data by pressing $\text{f} \text{REG}$.

When you key a number into the display and press the $\Sigma+$ key, each of the following operations is performed:

- ▣ The number that you keyed into the X-register is added to the contents of storage register R_7 .
- ▣ The square of the number that you keyed into the X-register is added to the contents of storage register R_6 .
- ▣ The number that you keyed into the X-register is multiplied by the contents of the Y-register, and the product added to storage register R_5 .
- ▣ The number in the Y-register of the stack is added to the contents of storage register R_4 .
- ▣ The number 1 is added to storage register R_3 , and the total number in R_3 is then written into the display (The stack does not lift).

Thus, each press of the $\Sigma+$ key updates these summations and multiplications. The contents of the displayed X-register and the applicable storage registers are as follows:

Register	Data
Displayed X	n Number of entries.
R_3	n Number of entries.

R_4	Σy	Summation of y values.
R_5	Σxy	Summation of products of x and y values.
R_6	Σx^2	Summation of x^2 values.
R_7	Σx	Summation of x values.

In addition, the y-value present before the last press of the $\Sigma+$ key is retained in the Y-register, while the x-value present before $\Sigma+$ was pressed is retained in the LAST X register.

To see any of the summations at any time, you have only to recall the contents of the desired storage register. (In the case of the $\Sigma+$ key, recalling storage register contents or keying in a number simply writes over the number of entries (n) that is displayed. The stack does not lift.)

Example: Find Σx , Σx^2 , Σy , and Σxy for the paired values of x and y listed below.

y	7	5	9
x	5	3	8

Press	Display	
REG	0.00	Ensures that all storage registers are cleared to zero initially. (Assumes no results remain from previous example.)
7 ENTER	7.00	
5 $\Sigma+$	1.00	First pair is summed; $n = 1$.
5 ENTER	5.00	
3 $\Sigma+$	2.00	Second pair is summed; $n = 2$.
9 ENTER	9.00	
8 $\Sigma+$	3.00	All the data is summed; $n = 3$.
RCL 7	16.00	Sum of x values from register R_7 .
RCL 6	98.00	Sum of squares of x values from register R_6 .
RCL 5	122.00	Sum of products of x and y values from register R_5 .
RCL 4	21.00	Sum of y values from register R_4 .
RCL 3	3.00	Number of entries ($n = 3$).

Mean

The mean (arithmetic average) of data entered and summed using the $\Sigma+$ key is available by using the \overline{x} (mean) key. When you

68 Function Keys

press $\boxed{\Sigma x}$, the mean of the values of x is calculated using the data in storage registers $R_3(n)$ and $R_7(\Sigma x)$ and the formula:

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i$$

The easiest way to accumulate the required data in the applicable registers is through the use of the $\boxed{\Sigma+}$ key as described above. However, the required data may also be stored directly in storage registers $R_3(n)$ and $R_7(\Sigma x)$, if desired.

Example: A survey found ten of the wealthiest persons in the United States to have the following ages:

62 84 47 58 68 60 62 59 71 73

To find the average (mean) age of this sample of wealthy persons:

Press	Display	
\boxed{CLX} $\boxed{\square}$ \boxed{REG}	0.00	Storage registers and X-register cleared to zero.
62 $\boxed{\Sigma+}$, 84 $\boxed{\Sigma+}$, 47 $\boxed{\Sigma+}$, 58 $\boxed{\Sigma+}$, 68 $\boxed{\Sigma+}$, 60 $\boxed{\Sigma+}$, 62 $\boxed{\Sigma+}$, 59 $\boxed{\Sigma+}$, 71 $\boxed{\Sigma+}$, 73 $\boxed{\Sigma+}$	10.00	Number of entries.
$\boxed{\square}$ $\boxed{\Sigma}$	64.40	Average (mean) age in years.

Standard Deviation

The standard deviation (a measure of dispersion around the mean) is calculated using data in the applicable storage registers and the \boxed{s} (standard deviation) key. Pressing $\boxed{\square}$ \boxed{s} uses the data in registers $R_3(n)$, $R_6(\Sigma x^2)$, and $R_7(\Sigma x)$ to calculate the standard deviation according to the formula:

$$s_x = \sqrt{\frac{\sum x^2 - \frac{(\Sigma x)^2}{n}}{n-1}}$$

For example, to obtain the sample deviation in the above problem:

Press	Display	
S	10.10	Standard deviation.

If the 10 persons used in the sample were actually *the 10 wealthiest* persons, the data would have to be considered as a population rather than as a sample. The relationship between sample standard deviation (s) and the population standard deviation (s') is illustrated by the following equation:

$$s' = s \sqrt{\frac{n-1}{n}}$$

Since n is automatically accumulated in register R_3 when the data are accumulated by the $\Sigma+$ key, it is a simple matter to convert the sample standard deviation, which has already been calculated, to population standard deviation.

For example, if the accumulations in registers R_3 through R_7 are still intact from the previous example, you can calculate the population standard deviation this way:

Press	Display	
S	10.10	Sample standard deviation (s).
RCL 3	10.00	Recalls n .
1 -	9.00	Calculates $n-1$.
RCL 3 ÷	0.90	Divides $n-1$ by n .
x	9.58	Population standard deviation (s').

Deleting and Correcting Data

If you key in an incorrect value and have not pressed $\Sigma+$, press CLX and key in the correct value.

If one of the values is changed, or if you discover after you have pressed the $\Sigma+$ key that one of the values is in error, you can correct the summations by using the $\Sigma-$ key as follows:

1. Key the *incorrect* data pair into the X- and Y- registers.
2. Press 0 $\Sigma-$ to delete the incorrect data.
3. Key in the correct values for x and y . (If one value of an x, y data pair is incorrect, both values must be deleted and reentered.)
4. Press $\Sigma+$.

70 Function Keys

The correct values for mean and standard deviation are now obtainable by pressing $\boxed{\bar{x}}$ and \boxed{s} .

For example, suppose the 62-year old member of the *sample* as given above were to lose his position as one of the wealthiest persons because of a series of ill-advised investments in cocoa futures. To account for the change in data if he were replaced in the sample by a 21-year old rock musician:

Press	Display	
62	$\boxed{62.}$	Data to be replaced.
$\boxed{\Sigma-}$	$\boxed{9.00}$	Number of entries (n) is now nine.
21	$\boxed{21.}$	The new data.
$\boxed{\Sigma+}$	$\boxed{10.00}$	Number of entries (n) is ten again.

The new data has been calculated into each of the summations present in the storage registers. To see the new mean and standard deviation:

Press	Display	
$\boxed{\bar{x}}$	$\boxed{60.30}$	The new average (mean) age.
\boxed{s}	$\boxed{17.09}$	The new standard deviation.

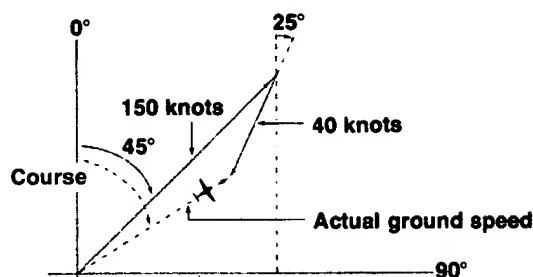
Vector Summations

The $\boxed{\Sigma+}$ key can be used to sum any quantities that are in the X- and Y-registers. You can even perform vector addition and subtraction using rectangular to polar coordinate conversion and the $\boxed{\Sigma+}$ and $\boxed{\Sigma-}$ keys.

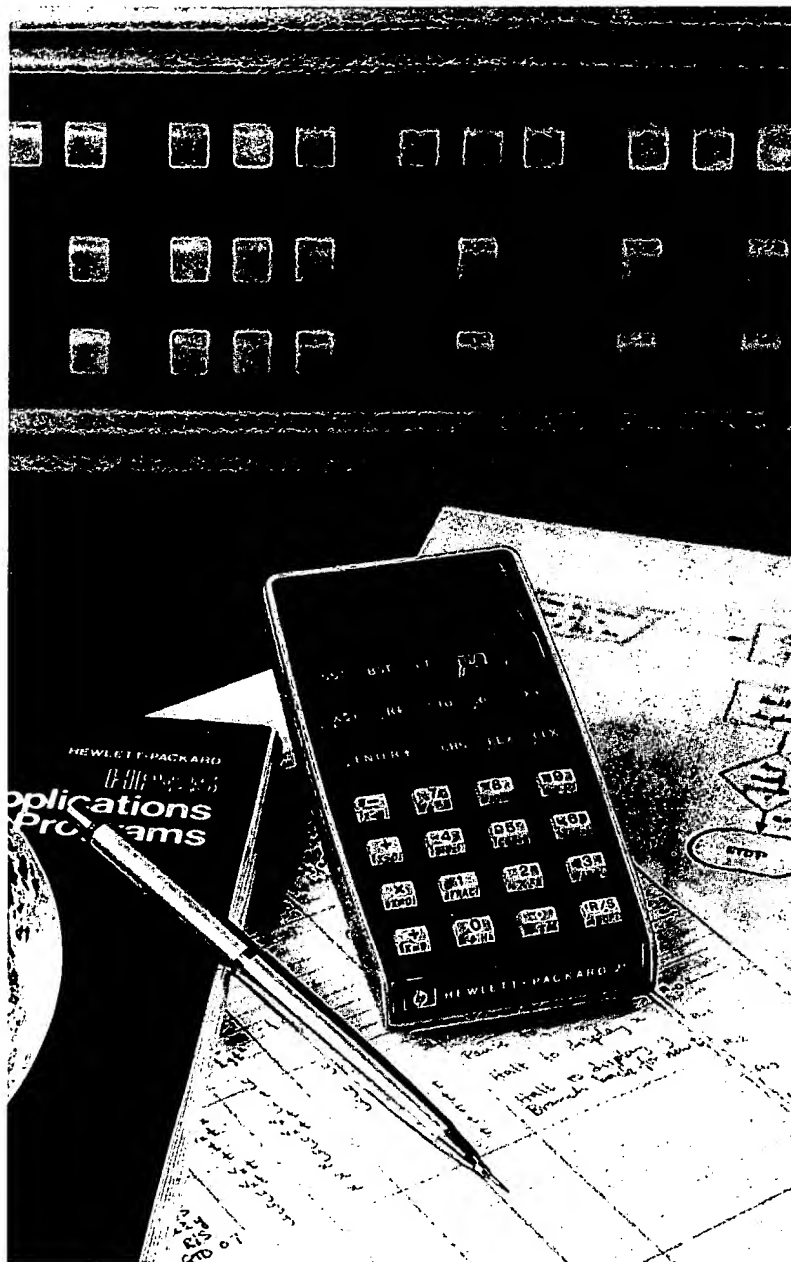
Example: In his converted Swordfish aircraft, grizzled bush pilot Apeneck Sweeney reads an air speed of 150 knots and a heading of 045° from his instruments. The Swordfish is also being buffeted by a headwind of 40 knots from a bearing of 025°. What is the actual ground speed and course of the Swordfish?

Method: The course and ground speed are equal to the sum of the instrument vector and the wind vector. The vectors are converted to rectangular coordinates and summed using the $\boxed{\Sigma+}$ and $\boxed{\Sigma-}$ keys. Their sum is recalled by recalling the values in storage registers R_4 (Σy) and R_7 (Σx), and the new rectangular coordinates are then converted back to polar coordinates

to give the vector of the actual ground speed and course.



Press	Display	
REG	0.00	Clears storage registers. (Display assumes no results remain from previous examples.)
9 DEG	0.00	Sets degrees mode.
45 ENTER +	45.00	θ for the Swordfish instrument vector.
150	150.	r for the Swordfish instrument vector.
R	106.07	Converted to rectangular coordinates.
Σ+	1.00	Instrument coordinates accumulated in storage registers R_4 and R_7 .
25 ENTER +	25.00	θ for wind vector.
40	40.	r for wind vector.
f R	36.25	Converted to rectangular coordinates.
Σ-	0.00	Coordinates for wind vector subtracted from coordinates for Swordfish's instrument vector.
RCL 4	89.16	Recalls sum of y-coordinates from register R_4 .
RCL 7	69.81	Recalls sum of x-coordinates from register R_7 . (Sum of y-coordinates lifted to Y-register.)
9 P	113.24	Actual ground speed of the Swordfish in knots.
X Y	51.94	Course of the Swordfish in degrees.



Programming

As we briefly explained in the introduction, calculator programming is as simple as pressing the keys you would manually press to solve your problem. But even though HP-25 calculator programming is simple to understand and use, it is very powerful, featuring:

- An obvious programming language.
- 49 usable steps of program memory.
- The ability to combine several keystrokes into each step.
- Decision-making capability for sophisticated routines.
- Several editing operations to facilitate corrections.

Together these features provide you with the tools necessary to tackle complex problems with unabashed confidence.

What is a Program?




A program is nothing more than a sequence of manual keystrokes that is remembered by the calculator. You can then execute the program as often as you like with less chance of error. The answer displayed at the end of execution is the same one you would have obtained by pressing the keys one at a time manually. No prior programming experience is necessary for HP-25 calculator programming.

Why Write Programs?


Programs are written to save you time on repetitive calculations. Once you have written the keystroke procedure for solving a particular problem and recorded it in the calculator, you need no longer devote attention to the individual keystrokes that make up the procedure. You can let the calculator solve each problem for you. And because you can easily check the procedure in your program, you have more confidence in your final answer since you don't have to worry each time about whether or not you have pressed an incorrect key. The calculator performs the drudgery, leaving your mind free for more creative work.

Three Modes of Operation


There are three ways to use your HP-25 calculator:

- | | |
|-----------------------|---|
| 1. Manual RUN mode |  |
| 2. PRGM mode |  |
| 3. Automatic RUN mode |  |

Manual RUN Mode

The functions and operations you have learned about in the first four sections of this handbook are performed manually one at a time with the PRGM-RUN switch set to RUN . These functions combined with the automatic memory stack enable you to calculate any problem with ease.


PRGM Mode

In PRGM (*program*) mode the functions and operations you have learned about are not executed, but instead are recorded in a part of the calculator called *program memory* for later execution. All operations on the keyboard except three can be recorded for later execution with the PRGM-RUN switch set to PRGM . The three operations that cannot be recorded are:






These three operations work in PRGM mode to help you write and record your programs.

Automatic RUN Mode

The HP-25 can also be used to automatically execute a list of operations with the PRGM-RUN switch set to RUN  if they have previously been recorded in program memory. Instead of your having to press each key manually, the recorded operations are executed sequentially in automatic RUN mode when you press **R/S** (*run/stop*). You press only one key and the entire list of recorded operations is executed much more quickly than you could have executed them yourself.

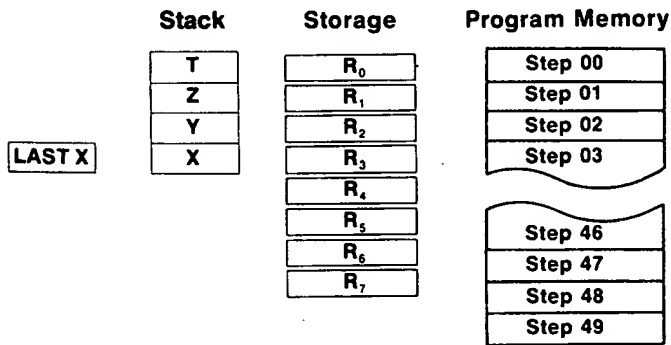
Introductory Program

The area of a sphere program you wrote, recorded, and executed in the introduction showed you that the sequence of keystrokes used to solve a problem manually is the same sequence used in a program. Now let's return our attention to that program to explain the information displayed in PRGM mode.

First, set the PRGM-RUN switch to PRGM  RUN so that the sequence of keystrokes will be recorded for later execution. Second, press   to clear the calculator of previous programs. The display will show:

00

This tells you that you are at the beginning of program memory. Step 00 contains an automatic stop instruction and cannot be used to record your program keystrokes. Program keystrokes are recorded in steps 01 through 49. (See figure below.)



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As you can see, the program memory for the HP-25 is separate from the four stack registers, the LAST X register, and the eight storage registers.

With 00 displayed in PRGM mode, you are ready to key in your program. Surface area of a sphere is calculated using the formula $A = \pi d^2$. The short list of keys for the area of a sphere program is shown below:

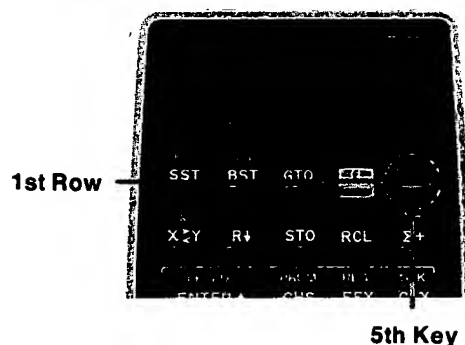
Keys	Comments
9 x^2	These keys square the diameter.
9 π	
\times	This key multiplies d^2 by π .

Keycodes

Press the first key of the program and the display will change to:

15

The two numbers on the right of the display designate the key stored in that step. Each key on the keyboard has a two-digit keycode. For convenience, the digit keys are coded 00 through 09. All other keys are coded by their position on the keyboard. The first digit denotes the row of the key and the second digit the number of the key in that row. So 15 tells you that the key is in the first row on the calculator and that it is the fifth key in that row, the 9 key.



This handy matrix system allows you to easily determine the code for each instruction without using a reference table.

Merged Keycodes

To conserve program memory when using prefixed functions, the keycodes for the prefix and the function are merged into one step. For an example of this press the second key of the program, x^2 , and the display will change to:

01	15 02
----	-------

The two-number code 01 that has appeared on the left side of the display designates the step number of program memory that is being displayed. The two pairs of numbers on the right side of the display indicate that the function x^2 has been recorded in that step (01) of program memory. Digits 1 and 5 denote the x^2 key. Digits 0 and 2 denote the 2 key. The operation stored then, is x^2 which is the x^2 function. In every case, a single operation (e.g., \sin , STO $+$ 1 , $x \rightarrow y$) uses only one step of program memory.


Each operation, prefixed or not, requires only one step of program memory.

The keys for finding the area of a sphere and their corresponding displays are shown below. Press each key in turn and verify the keycode shown in the display.

Key	Display
x^2	01 15 02
π	02 15 73
\times	03 61

In this case, a program consisting of five keystrokes takes only three steps of program memory.

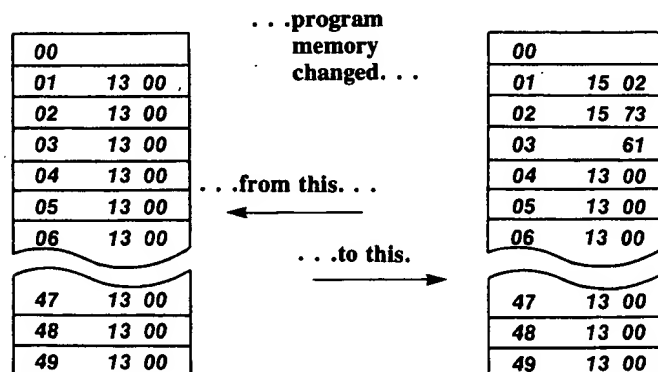
Running a Program


Programs are executed in automatic RUN mode. So first set the PRGM-RUN switch to RUN  RUN. Next press **GTO** **0** **0**. This operation resets the calculator so that program execution will begin from step 00 (Pressing **f** **PRGM** in RUN mode accomplishes the same thing.) Then, key in a value for a diameter and press **R/S** in RUN mode to run your program. The operations stored in program memory are executed sequentially downward from step 00. First step 01 is executed, then step 02, then step 03, and then step 04, which now contains a special instruction, **GTO** **0** **0**.

GTO 00

The **GTO** **0** **0** instruction in step 04 is not an instruction you keyed in yourself. It was already there. If you press **f** **PRGM** in PRGM mode or if you switch the calculator OFF and ON again, program memory is *filled* with **GTO** **0** **0** instructions. The three-step program you keyed in replaced three of these instructions. Program memory was changed as shown in the following illustration.

When you keyed in your program. . .



The illustration on the left shows program memory immediately after pressing  **PRGM** in PRGM mode or turning the HP-25 ON. The illustration on the right shows program memory after recording the three-step example program.

A **GTO 00** instruction in the program tells the calculator to go to step 00 and execute the automatic stop instruction there next. If **R/S** is pressed again in automatic RUN mode, the calculator will begin executing instructions from step 00 as it did the first time. Each time the calculator executes the program, it ends execution at step 00, ready to begin again.

If you had recorded a 49-step program, after executing step 49 the calculator would execute the automatic stop instruction stored in step 00. Then you would have to press **R/S** to execute the program again.

Now try an example.

Example. Calculate the surface area of a spherical “cat’s-eye” (marble) with a diameter of 1.3 centimeters. Then calculate the surface area of a baseball with a diameter of 2.5 inches.

Press	Display	
1.3 R/S	5.31	Area of the marble in square centimeters.
2.5 R/S	19.63	Area of the baseball in square inches.



Each time you press **R/S** the calculator executes the sequence of keystrokes you have recorded. You calculate the same answers you would obtain if you did each problem manually, but without the time or the tedium.

Writing a Second Program







Now let’s write a second program and use it to further explore the programming capability of your HP-25 calculator. Suppose you want to write a program that will calculate the increase in

where d_0 is the original diameter of the balloon and d_1 is the new diameter. If d_0 were entered in the Y-register and d_1 were keyed into the X-register, the problem could be solved manually by pressing the keys shown in the left-hand column that follows.




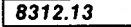
Keys	Display	
ENTER	01 31	
3	02 03	
y^x	03 14 03	Cube the new diameter.
$x \div y$	04 21	
3	05 03	
y^x	06 14 03	Cube the original diameter.
$-$	07 41	Subtract the cubes.
9 π	08 15 73	
\times	09 61	Multiply by π .
6	10 06	
\div	11 71	Divide by 6.

The program keystrokes for this problem are the same. Simply switch to PRGM mode  RUN and press  PRGM to clear program memory and display step 00. Then key in the list of keys above. The keys are not executed, but are recorded in program memory steps 01 through 11. Verify that each key-code is correct as you key in each instruction by checking the displays shown.



(Notice that you had to record the **ENTER** key as an instruction in this program. The **ENTER** instruction here separates the number 3 that is the second step of the program from the digits for the new diameter that you will key in later.)







To run the program switch to automatic RUN mode   and press  (or   ) so that the calculator will begin execution from step 00. Then try the following example.

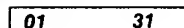
Example. Find the increase in volume of a spherical balloon if the diameter changes from 30 feet to 35 feet.

Press	Display	
30 		Enter the original diameter into Y.
35 		Key the new diameter into X and run the program. The answer, in cubic feet, is displayed.

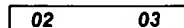
Displaying Each Step




In order to look at this program, you need to be able to display each step. Two operations allow you to do this:  (*single step*) and  (*back step*).


With the increase in sphere volume program still recorded in the calculator set the PRGM-RUN switch to RUN   and press  to reset the calculator to step 00. Then switch to PRGM mode   and press  once. The display will change to:




Press  again and the display will change to:





Now press . You can see what has happened. You are back at program memory step 01. Press  again and step 00 is displayed. Pressing  again does nothing.



 displays the contents of the *next* step of program memory.

 displays the contents of the *previous* step of program memory.

Of course, because these two keys work in PRGM mode, neither can be stored in program memory.

Displaying a Particular Step

If you want to see one of the later steps of your program, **SST** is not convenient. To display a particular step of program memory use the **GTO** key with the PRGM-RUN switch set to RUN . Simply press **GTO** and then key in the desired two-digit step number. Then set the PRGM-RUN switch to PRGM  and the contents of the specified step will be displayed.

For example, to see step 10 in the previous program, set the PRGM-RUN switch to RUN  and press **GTO** **1** **0**. Then switch back to PRGM mode . The display will show:

10	06
----	----

When using the **GTO** key in this way, always use two digits for designating step numbers. For instance, to see step 6 you must press **GTO** **0** **6** in RUN mode and then switch back to PRGM mode.

If the first digit key following **GTO** is greater than four, the **GTO** key is ignored and the number is keyed into the X-register. Similarly, if one of the two keys following **GTO** is not a digit key, the **GTO** key is ignored and the operation associated with the invalid key is performed.

Interrupting Program Execution

From time to time you will want a program to stop execution by itself so that you can enter new data or view an intermediate result. There are two operations on your HP-25 calculator that will automatically interrupt program execution when they are encountered as program instructions: **R/S** and **PAUSE**.

Stopping Program Execution

[R/S] works differently as an executed instruction in a program than it does when pressed from the keyboard. As an executed instruction, **[R/S]** stops program execution, allowing you to key in new data or to write down an intermediate result.


When **[R/S]** is then pressed from the keyboard in automatic RUN mode, the calculator continues execution sequentially downward.

Example Program. Universal Tins, a canning company, needs to calculate the volumes of various cylindrically-shaped cans. Universal would also like to be able to record the area of the base of each can before the volume is calculated. One program to solve this problem follows.


This program calculates the area of the base of each can and then stops. When after you have written down that result, the program can be restarted to calculate the final volume. The formula used is:

$$\text{Volume} = \text{base area} \times \text{height} = \pi r^2 \times h$$

The radius (r) and the height (h) of the can are keyed into the X- and Y-registers, respectively, before the program is run.

To record this program, set the PRGM-RUN switch to PRGM  and press **[0] [PRGM]** to clear program memory and display step 00. Then key in the following list of keys.

Press	Display	
[9] [x²]	01 15 02	Square the radius.
[9] [π]	02 15 73	Place π in X.
[X]	03 61	Calculate the area of the base.
[R/S]	04 74	Stop to record the area.
[X]	05 61	Calculate the final volume.

In order to run this program set the PRGM-RUN switch to RUN  and press **[0] [PRGM]** so that the calculator

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will begin execution from step 00. Then use the program to complete the table below:

Height	Radius	Area of Base	Volume
25	10	?	?
8	4.5	?	?

Press	Display	
25 ENTER	25.00	Enter the height into the Y-register.
10 R/S	314.16	Program stops to display the area.
R/S	7853.98	Volume of first can is calculated.
8 ENTER	8.00	Enter the height into the Y-register.
4.5 R/S	63.62	Program stops to display the area.
R/S	508.94	Second volume is calculated.

With the height in the Y-register and the radius in the X-register, pressing **R/S** in automatic RUN mode calculates the area of the can's base; the program stops at the first **R/S** instruction encountered. Pressing **R/S** again calculates the volume of the can and program execution stops at step 00, ready to run again.

In general, **R/S** is recorded into a program when you need to display *more* than one answer. To display *only one* answer or the final answer of a series, the **GTO 0 0** instruction in a program is more convenient since the calculator ends execution at step 00, ready to begin again.

Pausing During Program Execution

An **1 PAUSE** instruction executed in a program momentarily interrupts program execution to display intermediate results that do not have to be written down. The length of the pause is about one second, although more than one **1 PAUSE** instruction can be used to lengthen the time if desired.

To see how **PAUSE** can be used in a program, we'll modify the cylinder volume program in the previous example. In the new program the area of the base will only be briefly displayed before the volume is calculated. This example will also show how different programming approaches can be taken to solve the same problem.

To key in the program, set the PRGM-RUN switch to PRGM **PRGM** **PRGM** RUN and press **PRGM** to clear program memory and display step 00. Then key in the following list of keys.

Press	Display	
g x²	01 15 02	Squares the radius in X.
g π	02 15 73	Places π in X.
x	03 61	Calculates the area of the base.
f PAUSE	04 14 74	Pauses to show the base area for one second.
x	05 61	Calculates final volume of can.

This program also assumes the height has been entered into the Y-register and the radius has been keyed into the X-register. If you have stored the instructions, set the PRGM-RUN switch to RUN **PRGM** **PRGM** RUN and press **PRGM** so that the calculator will begin execution from step 00. Now complete the table below using the new program.

Height	Radius	Area of Base	Volume
20	15	?	?
10	5	?	?

Press	Display	
20 ENTER	20.00	Enter the height into the Y-register.
15 RS	706.86	Area of base is displayed for one second.
	14137.17	Program stops, displaying the volume.
10 ENTER	10.00	Enter the second height into Y.

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5 **R/S**

78.54

Area of base is displayed for one second.

785.40

Program stops, displaying the volume.

Program Stops

At times a mistake of some kind in your program will stop program execution. To help you identify why the calculator stopped in the middle of your program, possible reasons are listed below.




Executing a R/S. The execution of a **R/S** instruction in a program halts program execution at the step following the **R/S**.

















Executing Step 00. Whenever step 00 is executed in a program, program execution stops at step 00.

Pressing Any Key. Pressing any key halts program execution. Be careful to avoid pressing keys during program execution. If a program has been stopped by pressing a key, be careful not to restart program execution in the middle of a digit entry key sequence within the program. For example in the section of a program shown below, if program execution halted at step 23, the number 13 would appear in the display. If **R/S** is pressed, the number 13 would be automatically pushed up into the stack and the number 4.7 would be keyed into the X-register.






19	61	
20	14	03
21	01	Digit entry
22	03	Digit entry
23	04	Digit entry
24	73	Digit entry
25	07	Digit entry
26	15	22

To avoid problems like this, you should switch to **PRGM** mode to see whether or not you are in the middle of a digit entry key sequence. If you are, you should use **SST** or **BST** to correct the situation. In this case, you should press **BST** twice in **PRGM** mode, then switch back to **RUN** mode and press **CLX**. Finally you can press **R/S** to resume program execution.

To key in the program set the mode switch to PRGM  and press   to clear program memory and display step 00. Then key in the list of keys shown below.

Press	Display	
	01 00	
 	02 23 01	Store zero in R ₁ .
 	03 24 01	Recall the current number for squaring.
 	04 15 02	Square the number.
 	05 14 74	Display the square briefly.
	06 01	
  	07 23 51 01	Increment the number in R ₁ by one.
  	08 13 03	Transfer program execution to calculate the next square.

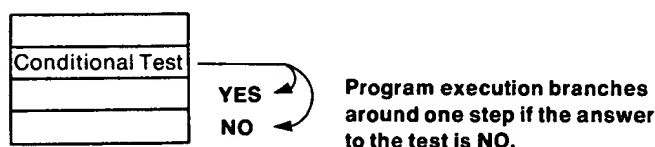
The program calculates the square of the number in storage register R₁, starting with zero. It pauses to show the answer and then increments the contents of the register by one. The unconditional branch at the end of the program is used to transfer program execution back to step 03 so that the calculation can be repeated with the new value in register R₁.

To run the program set the PRGM-RUN switch to RUN  and press   so that the calculator will begin execution from step 00. Then simply press . The squares of consecutive whole numbers will be shown one by one in the display. Press  again to stop execution whenever you wish.

Conditional Branching

Eight different program instructions give the HP-25 the ability to make decisions within a program depending on the outcome of a comparison of data values. These "conditionals" transfer program execution based on the outcome of the test. If the answer is YES, program execution continues sequentially downward. If the answer is NO, the calculator branches

around the following step, which can contain an unconditional branch or a simpler instruction (**CHS**, for example). The program makes a decision for you!





The eight different conditionals in your HP-25 are shown here. In each case, the tests are made on the 10-digit numbers and two-digit exponents actually stored in the stack registers, not on the displayed values.

- f** **[X<Y]** tests to see if the value in the X-register is less than the value in the Y-register.
- f** **[X≥Y]** tests to see if the value in the X-register is greater than or equal to the value in the Y-register.
- f** **[X≠Y]** tests to see if the value in the X-register is not equal to the value in the Y-register.
- f** **[X=Y]** tests to see if the value in the X-register is equal to the value in the Y-register.
- g** **[X<0]** tests to see if the value in the X-register is less than zero.
- g** **[X≥0]** tests to see if the value in the X-register is greater than or equal to zero.
- g** **[X≠0]** tests to see if the value in the X-register is not equal to zero.
- g** **[X=0]** tests to see if the value in the X-register is equal to zero.

Example Program. This program calculates the arc sine of an input value x (x must be within the limits of -1 and $+1$). The program tests the resulting angle, and if it is not greater than zero, adds 360 degrees to it. The angle displayed by the program, then, is always positive.

To key in the program set the mode switch to PRGM **PRGM** **NEW** **RUN** and press **f** **[PRGM]** to clear program memory and display step 00. Then key in the following list of keys.

Press	Display	
g sin⁻¹	01 15 04	Calculates the arc sine.
g x≥0	02 15 51	Compares the result to zero.
GTO 0 0	03 13 00	If greater than zero, display arc sine.
3	04 03	Otherwise add 360 degrees to the arc sine.
6	05 06	
0	06 00	
+	07 51	

To run the program set the PRGM-RUN switch back to RUN  and press  so that the calculator will begin execution from step 00. Then key in positive or negative values for x . The resultant arc sine will always be positive.

Press	Display	
g DEG	0.00	Set degrees mode.
.5 R/S	30.00	Arc sine of .5 equals 30 degrees.
.5 CHS	-0.5	Key in negative value for x .
R/S	330.00	360 is added to the arc sine to give a positive angle.

Editing a Program

Even the most experienced programmer finds errors in his programs. These errors range from mistakes in the original equations to mistakes in recording the program. Wherever they occur they need to be found and corrected, and the HP-25 is designed to make this error-checking process as easy as possible.



Finding the Error



One of the easiest ways to find out if your program is working properly is to work a test case in which you either know the answer or the answer can be easily determined. For example, if you have a program that calculates the area of a circle using the formula $area = \pi \times r^2$, you can easily determine that an input value of 1 for r will give an answer of π .



SST Execution. In longer programs a wrong test-case answer will seldom pinpoint the mistake. For these cases, you can slow down program execution by using the **SST** key in RUN mode. In RUN mode, the **SST** key will execute your program instruc-

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tions one at a time. When you hold the **SST** key down in RUN mode, the program step number and keycode are displayed. When you release the **SST** key, the instruction is executed. Use **SST** on the simple area of a circle program shown below to familiarize yourself with its operation.

Example Program. This program calculates the area of a circle using the formula: $A = \pi r^2$ where r is the radius. Set the PRGM-RUN switch to PRGM  RUN and press **f**  to clear program memory and display step 00. Then key in the list of keys shown below.

Press	Display
9 	01 15 02
9 	02 15 73
x	03 61

The program assumes that a value for r has been keyed into the X-register. To run the program, set the PRGM-RUN switch back to RUN  RUN and press **f** . Now step through the program in slow motion using a value of 10 for r .

Press	Display	
10	10.	
SST	01 15 02	When you hold SST down, the first instruction is displayed.
	100.00	When you release SST , the first instruction is executed.
SST	02 15 73	Again holding SST down displays the second instruction.
	3.14	Again releasing SST executes the second instruction.
SST	03 61	Holding SST down displays the third instruction this time.
	314.16	And releasing SST executes the third instruction.

You can see that it would be easy to spot a mistake in your program using the **SST** key.

When you hold the **BS** key down in RUN mode, the program step number and keycode for the previous step are displayed. When you release **BS**, the X-register is again displayed. However if you switch back to PRGM mode, you will find that the previous step is now displayed. And if you press **R/S** in RUN mode after pressing **BS**, the calculator will begin execution from the previous step in program memory. Now press **BS** in RUN mode to review the program instructions of the above program.

Press	Display	
BS	03 61	Holding BS down in RUN mode displays the previous instruction.
	314.16	Releasing the BS key displays the original contents of the X-register.
BS	02 15 73	Again holding BS down displays the previous step in program memory.
	314.16	And releasing BS displays the original contents of the X-register again.

If you now switch to PRGM mode the second step will be displayed:

02 15 73

Cued Stops. If you have a program that is halted several times during execution for data entries, you may want to “identify” each stop by recording a familiar number into the program just before each **R/S** instruction. Then when the calculator stops execution because of the **R/S** instruction in the program, you can look at the displayed X-register to see the “identification number” for the required input. For example if your program contains eight stops for data inputs, it may be helpful to have the numbers 1 through 8 appear so you know which input is required each time. These identification numbers are helpful in editing a program.

If you key in data after the program has stopped running, remember that resuming program execution does not terminate digit entry. Thus, the calculator will assume that the digits in the program are part of the number you have just keyed in unless you press **ENTER** after you key in the data and before you resume running the program, or there is an **ENTER** in the program immediately after the **R/S** instruction.

Changing One Instruction

Changing or correcting one step of your program is easy with your HP-25 calculator because of the features built into it. Once the error has been found, use **SST** or **BST** in PRGM mode or **GTO** in RUN mode to display the step *preceding* the step to be changed. For example, to change the instruction in step 06, you need to display step 05. If you wish to change the step, simply press the correct key or keys for step 06. They will write over and replace the incorrect information already stored in that step.

If step 06 is an extra step in your program, press **g** **NOP** (*no operation*). This instruction tells the calculator not to perform any operation here.




Example Program. The program represented below is designed to take the cube root of a number.


Press	Display
ENTER	01 31
3	02 03
g $\frac{1}{x}$	03 15 22
y^x	04 14 03



Suppose that upon reviewing the program with the **SST** key, however, you discover you have keyed in the following mistake-ridden program:



Press	Display
ENTER	01 31
3	02 03
g %	03 15 21
x\divy	04 21
y^x	05 14 03





Oops! You pressed the wrong key.
And you pressed it again by mistake.





Set the PRGM-RUN switch to PRGM   RUN, press , and key in this mistake-ridden second program now.

To correct the program, press  three times to display step 02. Then correct the first mistake by keying in the correct keys for step 03.



Press	Display	
	<div style="border: 1px solid black; padding: 2px; display: inline-block;">02 03</div>	First display this step.
 	<div style="border: 1px solid black; padding: 2px; display: inline-block;">03 15 22</div>	Then press the correct keys for step 03.

With step 03 displayed you are ready now to correct step 04. Since this is an unwanted extra step, use the   function to replace its contents.


Press	Display	
	<div style="border: 1px solid black; padding: 2px; display: inline-block;">03 15 22</div>	Display step 03 to correct step 04.
 	<div style="border: 1px solid black; padding: 2px; display: inline-block;">04 15 74</div>	Press   so that the calculator will not perform an operation here.

Now set the PRGM-RUN switch back to RUN   RUN and press   to reset the calculator to step 00. The example below will help you determine whether or not you have corrected the program.

Example. Find the cube root of 8 and then of 125.

Press	Display
8 	<div style="border: 1px solid black; padding: 2px; display: inline-block;">2.00</div>
125 	<div style="border: 1px solid black; padding: 2px; display: inline-block;">5.00</div>

Adding Instructions

If you have recorded a medium-sized program and have left out a crucial sequence of keystrokes right in the middle, you do not have to start over. The missing sequence of keystrokes can be recorded in the available steps following your program. You can then use the  key to make an unconditional branch to the sequence when it is needed and then make a second unconditional branch back to the main part of your program at the end of the sequence.

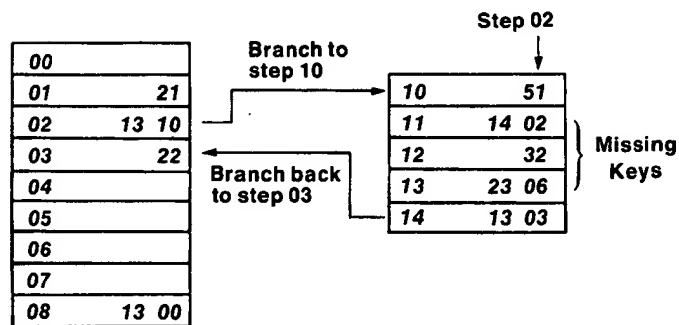
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The program segment shown below should make this more clear. Three keys are missing between steps 02 and 03. Three keys are missing between steps 02 and 03.

00	
01	21
02	51
03	22
04	
05	
06	
07	
08	13 00

Missing three steps (**f** **√x** , **CHS** and **STO** **[6]**) here.

In order to add the missing steps we need to branch to one of the available program steps in program memory. The corrected program is shown below.







Notice in particular that the instruction originally stored in step 02 is now stored in step 10. Step 02 now contains an unconditional branch instruction to step 10. The missing keys are stored in steps 11 through 13 and the instruction stored in step 14 is an unconditional branch back to step 03 in the main program.

































Program Applications




The following two programs are provided as additional examples to test your programming skills. Only the purpose of each program is explained. See if you can figure out how each program works on your own.


Factorial

This program calculates the factorial of an input value “ n ” [$n(n-1)(n-2) \dots 3 \times 2 \times 1$]. (For the special case where $n = 0$, $0! = 1$.) Switch to PRGM mode   RUN and press  before keying in the following list of keys.

 before keying in the following list of keys.

Keys	Display
 	01 15 03
 	02 14 01
 	03 23 01
 	04 15 71
  	05 13 14
	06 01
 	07 14 71
  	08 13 16
	09 21
	10 01
	11 41
  	12 23 61 01
  	13 13 06
	14 01
  	15 13 00
 	16 24 01

Now switch back to RUN mode   RUN and press .

 so you can try the following example.

Example. Calculate the number of ways six people can line up for a photograph.

Method: $P_6 = 6!$

Press	Display
6 	720.00 (6 × 5 × 4 × 3 × 2 × 1)

Converging Series

This program uses the following series to approximate the value of "e" ($e = 1/0! + 1/1! + 1/2! + \dots + 1/n!$). It then tests each approximation against the value for "e" generated by the calculator by pressing $\boxed{1} \boxed{9} \boxed{e^x}$. Each approximation is displayed, then the difference between the approximation and the calculator's value for "e" is displayed. When the two values are equal, the program stops and displays the number of terms it took for the series to converge.

Switch to PRGM mode $\boxed{\text{PRGM}} \boxed{\text{RUN}}$ and press $\boxed{\text{PRGM}}$ before keying in the following list of keys.

Keys	Display
$\boxed{1}$	01 01
$\boxed{\text{STO}} \boxed{0}$	02 23 00
$\boxed{\text{STO}} \boxed{1}$	03 23 01
$\boxed{\text{ENTER}} \boxed{+}$	04 31
$\boxed{9} \boxed{1/x}$	05 15 22
$\boxed{\text{RCL}} \boxed{0}$	06 24 00
$\boxed{+}$	07 51
$\boxed{\text{STO}} \boxed{0}$	08 23 00
$\boxed{1}$	09 01
$\boxed{9} \boxed{e^x}$	10 15 07
$\boxed{\text{f}} \boxed{X \approx Y}$	11 14 71
$\boxed{\text{GTO}} \boxed{2} \boxed{6}$	12 13 26
$\boxed{X \leftrightarrow Y}$	13 21
$\boxed{\text{f}} \boxed{\text{FIX}} \boxed{9}$	14 14 11 09
$\boxed{\text{f}} \boxed{\text{PAUSE}}$	15 14 74
$\boxed{\text{f}} \boxed{\text{PAUSE}}$	16 14 74
$\boxed{-}$	17 41
$\boxed{\text{f}} \boxed{\text{PAUSE}}$	18 14 74
$\boxed{\text{R} \leftrightarrow}$	19 22
$\boxed{\text{RCL}} \boxed{1}$	20 24 01
$\boxed{1}$	21 01
$\boxed{+}$	22 51

STO	1	23	23	01
X		24	61	
GTO	0	4	25	13 04
RCL	1	26	24	01
f	FIX	2	27	14 11 02

Switch back to RUN mode **PRGM** **◀** **▶** **RUN** and press **f** **PRGM** before trying the program yourself by pressing **R/S**.

Your series should converge after 11.00 terms.

Afterword

If you have worked completely through this handbook, you should have a very good knowledge of all of the basic functions of the HP-25. But in fact you've only begun to see the power of the calculator. You'll come to understand it better and appreciate it more as you use the HP-25 daily to solve even the most complex mathematical expressions. At your fingertips you have a tool that was unavailable to Archimedes, Galileo, or Einstein. The only limits to the flexibility of the HP-25 are the limits of your own mind.

Appendix A

Accessories, Service and Maintenance

Standard Accessories

Your HP-25 comes complete with one each of the following standard accessories:

Battery Pack (installed in calculator before packaging)
Soft Carrying Case
HP-25 Owner's Handbook
HP-25 Applications Programs
Battery Charger/AC Adapter
HP-25 Quick Reference Guide

Optional Accessories

Other accessories are specified on the Accessory Order Form.

To order additional standard or optional accessories for your HP-25 see your nearest dealer or fill out an Accessory Order Form and return it with check or money order to:

Hewlett-Packard
Advanced Products Division
19310 Pruneridge Avenue
Cupertino, CA 95014

If you are outside the U.S., please contact the Hewlett-Packard Office nearest you.

AC Line Operation

Your calculator contains a rechargeable battery pack that includes two nickel-cadmium batteries. When you receive your calculator, the battery pack inside may be discharged, but you

102 Accessories, Service, and Maintenance

can operate the calculator immediately by using the battery charger/ac adapter. Even though you are using the battery charger/ac adapter, *the batteries must remain in the calculator whenever the calculator is used.*

CAUTION

Attempting to operate the HP-25 from the ac line with the battery pack removed may result in damage to your calculator.

The procedure for using the battery charger/ac adapter is as follows:

1. If your charger has a line voltage select switch, make sure it is set to the proper voltage. The two line voltage ranges are 100 to 127 volts and 200 to 254 volts.

CAUTION

Your HP-25 may be damaged if it is connected to the charger when the charger is not set for the correct line voltage.

2. Set the HP-25 power switch to OFF.
3. Insert the female battery charger/ac adapter plug into the rear connector of the HP-25 and insert the power plug into a live ac power outlet.

CAUTION

The use of a charger other than the HP battery charger supplied with the calculator may result in damage to your calculator.

Battery Charging

The rechargeable batteries in the battery pack are being charged when you are operating the calculator from the battery charger/ac adapter. With the batteries in the calculator and the battery

charger connected, the batteries will charge with the calculator OFF or ON. Normal charging times from fully discharged battery pack to full charge are:

Calculator OFF: 6 hours

Calculator ON: 17 hours

Shorter charging periods will reduce the operating time you can expect from a single battery charge. Whether the calculator is OFF or ON, the HP-25 battery pack is never in danger of becoming overcharged.

Note: It is normal for the battery charger/ac adapter to be warm to the touch when it is plugged into an ac outlet. It is also normal for the HP-25 calculator itself to be warm to the touch with the ac adapter/battery charger connected for battery charging and the HP-25 ON-OFF switch set to OFF.

Battery Operation

To operate the HP-25 from battery power alone, simply turn the calculator OFF, disconnect the female battery charger plug from the rear of the calculator, and turn the calculator ON again. (Even when not connected to the calculator, the battery charger/ac adapter may be left plugged into the ac outlet.)

Using the HP-25 on battery power gives the calculator full portability, allowing you to carry it nearly anywhere. A fully charged battery pack provides approximately 2 to 5 hours of continuous operation. By turning the power OFF when the calculator is not in use, the charge on the HP-25 battery pack should easily last throughout a normal working day.

Most of the battery power consumed by the calculator is used to light the display, so you can maximize battery operating time by displaying the minimum number of digits necessary while calculating. If the HP-25 must be left ON between calculations,

1. is the display that consumes the least power.

Battery Pack Replacement

If it becomes necessary to replace the battery pack, use only another Hewlett-Packard battery pack like the one shipped with your calculator.

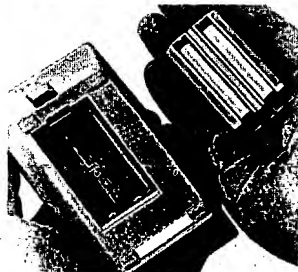
CAUTION

Use of any batteries other than the Hewlett-Packard battery pack may result in damage to your calculator.

To replace the battery pack, use the following procedure:



1. Set the calculator ON-OFF switch to OFF and disconnect the battery charger/ac adapter from the calculator.
2. Press down on the thumb-set at the rear of the calculator and slide the battery pack in the direction of the arrow.



3. When the key on the battery pack becomes visible, lever that end of the pack up and permit the battery pack to fall into the palm of your hand.



4. Insert the new battery pack in the direction of the arrow. Slant the leading edge of the pack into the edge of the doorway.
5. Snap the battery pack into place by pressing it gently.

If you use your HP-25 extensively in field work or during travel, you may want to order the optional Reserve Power Pack, consisting of a battery charging attachment and a spare battery pack. The Reserve Power Pack enables you to charge one battery pack while using the other in the calculator. See the Accessory Brochure shipped with the calculator for details.

If a battery pack will not hold a charge, and seems to discharge very quickly in use, it may be defective. The battery pack is warranted for one year, and if the warranty is in effect, return the defective pack along with your HP-25 and battery charger/ac adapter to Hewlett-Packard according to the shipping instructions. If the battery pack is out of warranty, see your nearest dealer or use the Accessory Order Form provided with your HP-25 to order a replacement.

Service

Low Power

When you are operating from battery power in RUN mode, all decimal points except the true one light to warn you that you have a minimum of 1 minute of operating time left.

6 0.2. 23 Low Power Display

True Decimal Point

You must then either operate the calculator from the battery charger/ac adapter as described under AC Line Operation, or you can substitute a fully charged battery pack for the one in the calculator.

Blank Display

If the display blanks out, turn the HP-25 OFF, then ON. If 0.00 does not appear in the display in RUN mode, check the following:

1. If battery charger is attached to the HP-25, make sure it is plugged into an ac outlet. If not, turn the calculator OFF before plugging the charger into the ac outlet.
2. Examine battery pack to see if the contacts are dirty.
3. Substitute a fully charged battery pack, if available, for the one that was in the calculator.
4. If display is still blank, try operating the HP-25 using the charger (with the batteries in the calculator).
5. If, after step 4, display is still blank, service is required. (Refer to Warranty paragraphs.)

Blurring Display

During execution of a stored program, the display continuously changes and is purposely illegible to indicate that the program is running. When the program stops, the display is steady.

Temperature Range

Temperature ranges for the calculator are:

Operating	0° to 45°C	32° to 113°F
Charging	15° to 40°C	59° to 104°F
Storage	-40° to +55°C	-40° to +131°F

Warranty

Full One-Year Warranty

The HP-25 is warranted against defects in materials and workmanship for one year from the date of delivery. During the warranty period, Hewlett-Packard will repair or, at its option, replace at no charge components that prove to be defective, provided the calculator is returned, shipping prepaid, to Hewlett-Packard's Customer Service facility. (Refer to Shipping Instructions.)

This warranty does not apply if the calculator has been damaged by accident or misuse, or as a result of service or modification by other than an authorized Hewlett-Packard Customer Service facility. No other express warranty is given by Hewlett-Packard. **Hewlett-Packard shall not be liable for consequential damages.**

Out-of-Warranty

Beyond the one-year warranty period, calculators will be repaired for a moderate charge. *All* repair work performed beyond the warranty period is warranted for a 90-day period.

Obligation to Make Changes

Products are sold on the basis of specifications applicable at the time of sale. Hewlett-Packard shall have no obligation to modify or update products once sold.

Shipping Instructions

Whether the unit is in-warranty or out-of-warranty, it is the customer's responsibility to pay charges for shipping to the

Accessories, Service, and Maintenance **107/108**

applicable service facility listed on the *Service Card*. During warranty, the service facility will, in turn, ship the unit back to the customer prepaid, via the fastest economical means.

On out-of-warranty repairs, the customer will pay shipping charges both ways.

Malfunctions traced to the calculator, batteries, or battery charger require that you return the following to us:

Calculator with all standard accessories.
Completed *Service Card*.

Send returned items safely packaged to the address shown on the *Service Card*.

Under normal conditions, calculators will be repaired and re-shipped within five (5) working days of receipt at any Hewlett-Packard Service Facility listed on the *Service Card*.

Should other problems or questions arise regarding service, please call your nearest Hewlett-Packard sales or service facility.

Improper Operations

If you attempt a calculation containing an improper operation—say, division by zero—the display will show **Error**. To clear, press **CLX**.

The following are improper operations:

- \div , where $x = 0$
- y^x , where $y \leq 0$
- \sqrt{x} , where $x < 0$
- $\frac{1}{x}$, where $x = 0$
- \log , where $x \leq 0$
- \ln , where $x \leq 0$
- \sin^{-1} , where $|x| > 1$
- \cos^{-1} , where $|x| > 1$
- STO** \div , where $x = 0$
- \bar{x} , where $n \leq 0$
- S**, where $n \leq 1$

Stack Lift and LAST X

Stack Lift

A number keyed in following one of these operations lifts the stack:

$\frac{\square}{\square}$	\cos	$\leftrightarrow \text{HMS}$	SCI
$+$	\cos^{-1}	$\leftrightarrow \text{H}$	ENG
\times	\tan	ABS	$\text{STO } \square$
\div	\tan^{-1}	$\frac{1}{\square}$	$\text{RCL } \square$
e^x	INT	$\%$	$\text{STO } - \square$
\ln	FRAC	$\bar{\square}$	$\text{STO } + \square$
\log	$\sqrt{\square}$	S	$\text{STO } \times \square$
10^x	\square^2	$\square \times \square$	$\text{STO } \div \square$
\sin	π	$\text{R} \uparrow$	$\leftrightarrow \text{R}$
\sin^{-1}	y^x	FIX	$\leftrightarrow \text{P}$

A number keyed in following one of these keys does not affect the stack:

f	g	STO	\square thru g
CHS	EEX	\cdot	

A number keyed in following one of these operations writes over the number in the X-register and the stack does not lift:

CLX	$\text{ENTER} \uparrow$	$\Sigma +$	$\Sigma -$
--------------	-------------------------	------------	------------

LAST X

The following operations save x in LAST X:

$\frac{\square}{\square}$	FRAC	\cos	$\frac{1}{\square}$
$+$	INT	\cos^{-1}	y^x
\times	\ln	\tan	e^x
\div	\log	\tan^{-1}	10^x
$\leftrightarrow \text{HMS}$	\sin	$\sqrt{\square}$	$\leftrightarrow \text{R}$
$\leftrightarrow \text{H}$	\sin^{-1}	\square^2	$\leftrightarrow \text{P}$
ABS			

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Service Card

Refer to the appendix of your Owner's Handbook to diagnose a calculator malfunction. The warranty period for your calculator is one year from date of purchase. Unless **Proof Of Purchase** is enclosed (sales slip or validation) Hewlett-Packard will assume any unit over 12 months old is out of warranty. **Proof Of Purchase** will be returned with your calculator. Should service be required, please return your calculator, charger, batteries and this card protectively packaged to avoid in-transit damage. Such damage is not covered under warranty.

Inside the U.S.A.

Return items safely packaged directly to:

**Hewlett-Packard
APD Service Department
P.O. Box 5000
Cupertino, Calif. 95014**

We advise that you insure your calculator and use priority (AIR) mail for distances greater than 300 miles to minimize transit times. All units will be returned via priority mail.

Outside the U.S.A.

Where required please fill in the validation below and return your unit to the nearest designated Hewlett-Packard Sales and Service Office. Your warranty will be considered invalid if this completed card is not returned with the calculator.

Model No. _____

Serial No. _____

Date Received _____

Invoice No./Delivery Note No. _____

Sold by:

Calculator Catalog and Buying Guide Request Card

Primary Interest:

☐ Scientific Calculators

☐ Business Calculators

☐ Both

Valid in U.S. only

HEWLETT  PACKARD

430C

A friend or associate might also want to know about Hewlett-Packard calculators. If you would like us to send him the Hewlett-Packard Calculator Catalog and Buying Guide, please mail his name and address on this postage paid Request Card.

Name _____

Title _____

Company _____

Street _____

City _____ State _____ Zip _____

BUSINESS REPLY MAIL

No postage stamp is necessary if mailed in United States

Postage will be paid by:

Hewlett-Packard
19310 Pruneridge Avenue
Cupertino, CA 95014

FIRST CLASS

Permit No.

232

Cupertino
California

Service Information

Must be completed and returned with your calculator, charger and batteries.

Name

Company

Street Address

City

State

Zip

Date

Home Phone

Work Phone

Describe Problem:

Model No.

Serial No.

Preferred method of payment for out of warranty repairs.
If not specified, unit will be returned C.O.D.

- ☐ BankAmericard
☐ Master Charge

Card No.

Expiration Date

Name appearing on credit card

- ☐ Purchase Order, Companies with established Hewlett-Packard credit only. (P.O. included)

P.O. Number

Authorized Signature

HEWLETT  PACKARD

Useful Conversion Factors

The following factors are provided to 10 digits of accuracy where possible. Exact values are marked with an asterisk. For more complete information on conversion factors, refer to *Metric Practice Guide E380-74* by the American Society for Testing and Materials (ASTM).

Length

1 inch	= 25.4 millimeters*
1 foot	= 0.304 8 meter*
1 mile (statute)†	= 1.609 344 kilometers*
1 mile (nautical)†	= 1.852 kilometers*
1 mile (statute)†	= 1.150 779 448 miles (nautical)†

Area

1 square inch	= 6.451 6 square centimeters*
1 square foot	= 0.092 903 04 square meter*
1 acre	= 43 560 square feet
1 square mile†	= 640 acres

Volume

1 cubic inch	= 16.387 064 cubic centimeters*
1 cubic foot	= 0.028 316 847 cubic meter
1 ounce (fluid)†	= 29.573 529 56 cubic centimeters
1 ounce (fluid)†	= 0.029 573 530 liter
1 gallon (fluid)†	= 3.785 411 784 liters*

Mass

1 ounce (mass)	= 28.349 523 12 grams
1 pound (mass)	= 0.453 592 37 kilogram*
1 ton (short)	= 0.907 184 74 metric ton*

Energy

1 British thermal unit	= 1 055.055 853 joules
1 kilocalorie (mean)	= 4 190.02 joules
1 watt-hour	= 3 600 joules*

Force

1 ounce (force)	= 0.278 013 85 newton
1 pound (force)	= 4.448 221 615 newtons

Power

1 horsepower (electric)	= 746 watts*
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Pressure

1 atmosphere	= 760 mm Hg at sea level
1 atmosphere	= 14.7 pounds per square inch
1 atmosphere	= 101 325 pascals

Temperature

Fahrenheit	= 1.8 Celsius + 32
Celsius	= 5/9(Fahrenheit - 32)
kelvin	= Celsius + 273.15
kelvin	= 5/9 (Fahrenheit + 459.67)
kelvin	= 5/9 Rankine

† U.S. values chosen. * Exact values.



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